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New England Quarry, Devon

Summary of Baseline Bat Survey Work 2008-2011

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1.0 INTRODUCTION

1.1 Background to the scheme

A planning application was submitted in January 2010 (DCC/2975/2010) by Viridor for a proposed Resource Recovery Centre (RRC) and associated infrastructure within the mothballed New England Quarry, just south of Lee Mill, Devon. The Resource Recovery Centre would, if consented, incorporate an Energy from Waste (EfW) plant with associated facilities and infrastructure, including a new access road (with a new river crossing over the River Yealm) to link the site to the A38 at Lee Mill.

With specific respect to ecology, parts of the site fall within a County Wildlife Site, an Ancient Woodland and a floodplain. Extensive ecological mitigation has been proposed including woodland conservation management aimed in part at enhancing the site for bats.

The planning application was accompanied by an Environmental Statement. Following the planning submission, a consultation process to gain the views of statutory and non-statutory consultees resulted in Devon County Council requesting additional information under the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 - a Regulation 19 Request for additional information - in order to determine the application. The Regulation 19 request allowed the Applicant to re-consider many aspects of the scheme and enabled a number of amendments to the mitigation scheme which are anticipated to further reduce environmental impacts.

1.2 Regulation 19 request with respect to bats

With specific respect to bats, R19.72 is pertinent. It is understood that this was compiled following comments to DCC from the Dartmoor National Park Authority Ecologist. The DCC information request response was as follows:

“Taking into account comments from Dartmoor National Park Authority, R19.72 - the applicant should carry out a more detailed bat survey and any impacts on the existing colony [a maternity colony of barbastelle at Dendles Wood SSSI¹] should be assessed and included as a part of the ES. There appears to have been no survey of the woodland for bat tree roosts along the line of the new road and the applicant’s attention was drawn to this by letter from the WPA (dated 3rd February 2010). Tree bat roost surveys are needed now for any trees that will be lost to ensure no maternity roosts are present and prior to the commencement of development.”

The Applicants R19 response was as follows:

Further bat surveys have been undertaken within woodland habitats including the proposed new access route. The results of these surveys were presented in Appendix R19.72 – Phase II Woodland and Bat Surveys.

1.3 Further requests for information with respect to bats

Following re-submission of the R19 material, in 2011, SLR Ecologists engaged directly with the County Ecologist in an attempt to resolve outstanding issues, since the authority was still unsatisfied with resubmitted ecological information. The Dartmoor National Park Authority (the originators of the original R19 request) provided additional clarification regarding bat

¹ Authors note

survey requirements during summer 2011 in an email dated 15 July, within which the applicant was requested to:

“...consider what impact the proposals might have on Dartmoor species and habitats, in this particular case a maternity colony of barbastelle bats in Dendles Wood SSSI (Site of Special Scientific Interest), which lies around 6 km upstream along the River Yealm, which runs through the wider application site and close to a proposed access road which contains a number of trees that would need to be felled prior to construction commencing”.

Specific additional questions from the National Park Ecologist were that the Applicant should address: (i) whether the proposed severance of the woodland and the loss of potential roost trees would have an impact on the ability of barbastelle bats to commute, forage and roost in the woodland, in particular in the woodland within which the access track would run (ii) whether the proposed works would result in an impact on the maternity colony known to be present in Dendles Wood SSSI (iii) that the Bat Conservation Trust's National Bat Monitoring Programme for woodland bats should be followed by surveyors, since this takes special account of the difficulty of finding barbastelle bat roosts. [The latter survey approach was specifically requested by the National Park Authority, owing to the difficulty of determining presence of this nationally rare species].

1.4 Scope of this report

Subsequent to the R19 requests, with specific respect to bats in trees along the proposed access route and nearby, there has been substantial additional survey work undertaken following ongoing dialogue between SLR Ecologists, the County Ecologist and the National Park Authority (NPA) Ecologist. This document provides an overview of all the bat survey work undertaken by SLR Consulting at this site since 2008. It is presented in order that the planning authority can properly assess the bat-related data and then reach a reasonable conclusion regarding likely impacts of the proposed development on bats (which are European Protected Species) both at this site and in particular on the colony in Dendles Wood SSSI.

Section 2 of this report sets the ecological context: it summarises relevant aspects of tree-roosting bat ecology, in particular for the woodland specialist species barbastelle, and reviews the detail (and adequacy of) currently guidance in respect of bat tree surveys. Finally, following discussion between the County Ecologist and the author of this report, Andrew McCarthy, Section 2 concludes with the outcome of an informal discussion between Andrew McCarthy and legal counsel on the legislative implications of trees being assessed as having *high potential* to support bats following negative survey results.

Section 3 summarises the results of each element of bat survey undertaken at this site since 2008. Reports are summarised in chronological order and commence with the 2008-2009 monthly transect study that formed the basis of the impact assessment in the original Environmental Statement. The report then sequentially describes the following additional studies undertaken in response (and subsequent to) the R19 request:

- (i) October 2010: a ground-based visual assessment of woodland containing trees with potential to support bats;
- (ii) April 2011: a ground-based and climbing inspection of all affected trees considered to have potential to support bats;
- (iii) Mid July, and August 2011: four transect survey sessions along the proposed access route in line with a request from the National Park Authority. As requested by the NPA, the survey methodology followed the Bat Conservation Trust (BCT)

National Bat Monitoring Programme protocol for woodland. Dawn and dusk surveys were undertaken at this time on two trees with cavities that could not be fully inspected during the April climbing survey;

- (iv) Mid August to early September 2011 - dawn-dusk surveys (two dusk and one dawn session each) on 18 trees assessed as having 'high' potential to support bats (see section 1.4 – tree surveys current best practice) but which are also envisaged to be affected by development; and
- (v) September 2011 – further climbing inspection of trees with potential to support bats.

2.0 ECOLOGICAL AND LEGAL CONTEXT

2.1 Barbastelle bat: summary of ecology, roost selection and local status

The barbastelle is a specialized moth predator, associated primarily (but not exclusively) with old woodland habitat in the UK; in particular with woodlands that have a high percentage of oaks with splits and flaking bark (C. Vine pers comm.). Radio tracking studies in the UK and Continental Europe have suggested that the predominance of moths (which have been shown to be up to 99% by volume in some studies) in the species narrow diet stems from a specific foraging behaviour; where individual bats hold separate 'foraging territories' within woodlands, along well-developed hedges and in and around small copses. Whilst most radio-tracking studies in the UK and Continental Europe show the species having a clear preference for richly-structured deciduous woodland, open ground does not provide a barrier to movement since bats have frequently been tracked across for example arable fields in order to reach roosts or foraging areas (C. Vine and C Mainstone pers comm.). There may be sex differences in habitat selection; males using patches around maternity roosts, as well as forest edges and more open habitats, whilst females appear to prefer deciduous woodland and linear features within woods [e.g. Greenaway (2004); Hillen et al (2009 and 2010); Russo et al (2005 and 2007) and Sierro (1999)].

The species generally roosts in ancient woodland trees (although there are notable exceptions such as old barns) and these can be extremely difficult to find without the assistance of radio-telemetry. Roost sites are often in split trunks and limbs and under flaking bark rather than in the more typical rot holes and crevices which are typically exploited by other tree roosting specialists in the UK; for example noctule *Nyctalus noctula*. Even radio-tracking is not infallible in pinpointing specific trees, since tracking signals are often lost once a tagged bat has reached a tree crevice. It is not usual to use radio-telemetry for location of roosts in trees during Ecological Impact Assessment studies unless there is a specific and very good reason to believe that trapping would yield success - i.e. that detector studies would need to show that barbastelle were present in sufficient numbers locally to make mist netting and tagging worthwhile (C. Vine pers comm.). The difficulty of finding roosts was demonstrated during the 2006 radio-tracking study in Dendles Wood SSSI on Dartmoor, which was known from previous studies to support a maternity colony of this species. The study, by experienced personnel, was undertaken for the Dartmoor National Park Authority by Geoff Billington and the results are reported in Billington (2006); surveyors recorded few bats during the initial detector survey and it was concluded that the maternity colony had moved away from the woodland during this particular summer. As a result the planned radio tracking work was curtailed.

Woodland oaks *Quercus* sp. seem especially favoured in the UK for roosting as well as occasionally ash and - very rarely - other tree species (C. Vine personal communication), although in other parts of the species range in Continental Europe other trees may be favoured, for example beech *Fagus sylvatica*. Chris Vine has found in his studies of the species in South East England that woodland oaks are preferred to all other species at a ratio of around 9:1.

As with many other woodland bats, barbastelle appear to switch roosts frequently; animals within a colony often having access to a 'cluster' of roosts within a woodland complex rather than being dependent on one or a small number of trees in a single area. As a result, it is ecologically much more relevant to think of a 'roost area' – i.e. a woodland with a number of suitable trees – rather than in terms of individual roost sites. Roost-switching appears less common with maternity roosts - presumably since lactating females probably need to avoid the risk of transporting dependent young.

2.1.1 Status of barbastelle on Dartmoor and around Dendles Wood

Dartmoor National Park Authority has commissioned a number of studies of this species in since 2002 and a maternity colony is known to occur in the vicinity of Dendles Wood SSSI; an ancient woodland site some 7.5km north of the proposed New England Quarry access road (the distance is probably closer to 10km for a bat in flight). In summary, surveys has found that favoured feeding habitat for this bat species were in Dendles Wood itself, as well as in the nearby Fernfires and Hawns Woods; along the River Yealm and along hedgerows south of Dendles Wood. In a few cases bats foraged south beyond the A38. The woodland complex around Dendles Wood is ecologically well-connected *via* wooded riparian corridors to habitat through which the proposed access road at New England Quarry would run; here some 18 trees with potential to be used by bats have been identified and classified as BCT 2a (see below).

The 2002 radio-tracking survey resulted in the capture and tracking of two individual bats and the 2003 survey in the capture and tracking of four individual bats. As stated above, during the 2006 study no bats were caught. The 2002 study found that bats from the Dendles Wood maternity roost were commuting over considerable distances to favoured feeding territories to the south, in particular (as far as this impact assessment is concerned) along the wooded River Yealm corridor as far as the area around Worston, several kilometres to the south of New England Quarry. The radio-telemetry from one tracked bat enabled 'activity areas' to be estimated by the researchers and it is noted that the area of woodland within which the access road to the scheme has been proposed lies just on the western edge of the 2002 'activity area'. Bats from the 2003 study commuted only as far south as Lee Mill (north of New England Quarry) but not south beyond the A38 (although it was inferred in the research report that a flight connection exists to habitat further south).

More recently, a radio-tracking study on (post breeding) Dartmoor barbastelle bats was undertaken by Matt Zeale. This study tracked a total of 19 bats from Houndtor Wood on Dartmoor to individual foraging areas typically up to 8.75km from the roost site; individual bats had foraging territories that did not seem to overlap and most bats consistently used the same foraging areas through the August and September period. The study found that bats preferred to feed over riparian habitats and around broad-leaved woodland and unimproved grassland; boundary features appeared to provide important foraging habitat. Importantly, bats emerged on average c24minutes after sunset but remained in the home wood for a further c28 minutes before leaving the area to forage.

2.2 Tree surveys for bats: current best practice

The key document guiding ecologists attempting to locate bat roosts (of any species) is the Bat Conservation Trust's 'Bat Survey Guidelines' (BCT, 2007) - Chapter 8 of which deals specifically with bats in trees. In addition, there are various other documents that surveyors refer to when designing bat surveys; including Natural England's Bat Habitat Assessment Prior to Arboricultural Operations: Guidance for Natural England's National Nature Reserves (Natural England, 2010) and The Arboricultural Associations' Trees and Bats Guidance Note No 1 (Cowan, 2003).

Notwithstanding it is the most up-to-date general guidance available at present, Chapter 8 of the BCT (2007) document is extremely unclear with respect to surveying trees on proposed development sites; in contrast arboriculture workers are well catered for with the document *via* Table 8.2 (Bat Survey Protocol for Trees due to be affected by Arboricultural Work on trees). This table, reproduced below as Table 1, uses a numerical grading system for trees considered to have potential to support bats; trees are allocated a grade from 1-3 during an initial ground-based visual inspection during which trees of high, moderate/low and negligible potential to support bats are categorised visually. 'High' equates to Category 2a,

'moderate/low' to 2b and 'negligible' to 3. Trees confirmed as supporting roosts are graded Category 1.

With specific respect to Category 2a and 2b trees (which have the subject of specific concern at New England Quarry by the County Ecologist) Table 1 (BCT Table 8.2) contains a number of further stages that are required to be followed following initial visual categorisation *during arboricultural works*².

Table 1 – BCT Bat Survey Guidelines extract from Table 8.2

Tree Category and description	Stage 1 Survey requirements prior to determination	Stage 2 Further measures to inform mitigation	Stage 3 Likely mitigation
Category 1	Tree identified on a map and on the ground. Further assessed to provide a best expert judgement on the likely use of the roost, numbers and species of bat, by analysis of droppings or other field evidence.	Avoid disturbance to trees where possible.	Felled under Habitats Regulations licence following the installation of equivalent habitats as a replacement. Felling would be undertaken taking reasonable avoidance measures such as 'soft felling' to minimise the risk of harm to individual bats.
Category 2a Trees that have a high potential to support bat roosts	Tree identified on a map and on the ground. Further assessed to provide a best expert judgement on the potential use of suitable cavities, based on the habitat preferences of bats. Ecologist involvement may be required.	Avoid disturbance to trees where possible. More detailed, off the ground visual assessment. Further dusk and dawn ³ surveys of establish presence of bats and if present the species, numbers of type of roost to inform the requirements for mitigation if felling is required.	Trees with confirmed roosts following further survey would be updated to Category 1 above and felled under licence as above. <u>Trees with no confirmed roosts would be downgraded to Category 2b and felled taking reasonable precautionary measures.</u>
Category 2b	None Ecologist involvement unlikely to be involved.	Avoid disturbance to trees where possible. No further surveys.	Trees would be felled taking reasonable avoidance measures.
Category 3	None. Ecologist involvement will not be required unless new evidence is found.	None	No mitigation for bats required.

The underlined section in the table above (2a/Stage 3) states that 'trees with no confirmed roosts would be downgraded to Category 2b and felled taking reasonable precautionary measures'. Since BCT (2007) explicitly states that the grading system in Table 8.2 is **NOT** to be used in development work (see lines 1-3, Para 4, Section 8.2.2 of the guidance; which then refers the reader to Section 8.2.4) it is our understanding that downgrading is only

² Authors emphasis

³ With regard to survey effort and timing at roosts (and by inference at potential roosts), BCT (2007) Chapter 8 refers to Chapter 4 of the same document; 2/3 survey sessions to be undertaken between May to September, with the optimum period being May to August. At least one of these surveys should comprise a dusk-dawn or a dusk AND dawn session.

applicable when undertaking arboriculture operations - i.e. where the process of grading and felling of trees is carried out within a few days of each other. Despite that the grading system in BCT Table 8.2 'is not considered appropriate for tree works on development sites' the system is widely used nationally in EclA since it is an useful shorthand for ecologists wishing to communicate tree features of potential value and it is helpful as a means of triggering detailed survey work – for example climbing and / or dawn-dusk surveys. Whilst the grading system has therefore been used for guidance at New England Quarry most trees that were initially graded at 2a have not been downgraded to 2b (despite negative survey results) since in our opinion most of these have potential to support bats at some point and the 2a grading must therefore remain to indicate *future potential*. The key point is that they do not appear to support bats *at the present time* and it is this which legal opinion suggests is the key factor during the planning decision making process (see 2.3 below).

Section 8.2.4 of the BCT guidance is entitled 'Assessing the Value of Trees on Development Sites'; it contains little helpful information for surveyors and urgently requires update and clarification. The section is highly generalised when compared to the detailed approach for arboriculture in Table 8.2. Section 8.2.4 states:

'it is essential that trees on and around the development site are assessed comprehensively for bats for all features of value. This information will be required to inform the mitigation strategy... other bat survey work on the site may inevitably have some overlap with the survey work required specifically for the trees and consequently suggestions for gauging the amount of survey effort are provided in Section 8.4'

Section 8.4 simply refers the reader to Chapter 4 of the document (see footnote¹ of this report).

Finally, Box 8.3 in BCT (2007) advises that if barbastelle or Bechstein's bat *Myotis bechsteinii* are suspected, then specialist opinion should be sought from ecologists experienced with the relevant species. In this instance discussions have been held with two ecologists; Chris Vine and Colleen Mainstone; both of whom have considerable experience radio tracking barbastelle bats.

Given the lack of detail in the current guidance, bat tree surveyors normally adopt a pragmatic combination of techniques. The approach to survey described in BCT (2007) (i.e. visual assessment; climb and inspect and dawn-dusk), whilst vague remains best practice and has as a result been adopted where practicable at New England Quarry. However, as discussed in the preceding section on barbastelle ecology, tree roosts for this species are extremely difficult to find and therefore a more habitat-based approach is required; to this end the BCT's Woodland Bat Survey⁴ protocol was adopted; the intention being to determine barbastelle activity levels in affected woodland and from this to make a reasoned judgement as to whether levels of activity indicate that a barbastelle roost (or roosts) may be present nearby (as well as roosts for other species). The BCT Woodland Bat Survey protocol involves walking a transect through a prescribed section of woodland - in this instance along the line of the proposed access route, taking into account all the 2a trees that could be affected. A total of three transect sessions were undertaken over the prescribed three survey periods: 25th July to 8th August, 9th to 23rd August and 24th August to the 7th September.

⁴ The BCT's Woodland Bat Survey protocol was specifically requested as appropriate at this site by the Dartmoor National Park Authority Ecologist.

2.3 Legal position

It was originally the view of the County Ecologist that if a tree is assessed as needing to have its 2a category retained following (negative) surveys had been carried out, it should be considered a probable bat roost for the purposes of EIA assessment. This is clearly unworkable, since has implications for planning decision-making and ecological survey nationally and not just at New England Quarry. As a consequence, informal discussions between the author of this report and legal counsel regarding the correct interpretation of the legislation (in particular the Conservation Regulations) indicates that if survey undertaken in line with best practice has failed to confirm presence of a European Protected Species (in this case bats), there is no legal reason why the three Habitats Regulations tests (including the need for alternative sites to be examined) should be invoked, since no offence would be committed. It would not be necessary for a planning authority to invoke the three Habitats Regulations tests simply because a feature (tree/building or whatever) has some unspecified future potential. Legal opinion appears to be that it is normal practice to re-survey a tree shortly before felling once a scheme has been consented - providing reasonable levels of survey have been undertaken at the pre-planning stage. In the event bats are subsequently found at the later stage, then this would need to be dealt with *via* an EPS licence prior to felling or tree surgery.

3.0 SUMMARY OF BAT SURVEY WORK TO DATE

3.1 2008-2009 transect work

The full results of this survey can be found in the SLR report Technical Appendix 12.4 Bat Survey Results (November, 2009). The report was appended to the original Environmental Statement.

The aim of this survey was to:

- Establish the current level of use of the wider site by bats in terms of roosting, commuting and foraging;
- Identify and quantify anticipated impacts associated with the development on local bat populations;
- Inform the mitigation scheme⁵ in order that negative impacts could be designed out at an early stage, then mitigated or compensated for;
- Make recommendations in respect of wider biodiversity enhancements;
- Provide legal advice on licensing requirements; and
- Provide information to inform the Environmental Statement in respect of bats and facilitate determination of the planning application.

Since report 12.4 is comprehensive in respect of describing and interpreting the survey results therein, only a summary discussion of the results pertinent to the assessment of affected trees is contained here (since other aspects of the scheme are dealt with elsewhere). As all the affected trees with potential to support bats (i.e. the 2a trees) lie along or close to the proposed access road, the main focus of the following discussion is on Transect I, since this sampled the woodland through which the proposed access road would run (or adjacent to it).

The survey commenced with a desk study; Devon Biological Records Centre (DBRC) was contacted and a search of the DBRC database was requested for records of bats within 2km of the site⁶. At that time DBRC did not exchange records with Devon Bat Group (DBG) and the local bat group was also contacted for additional data. The only survey that had been undertaken at New England Quarry prior to SLR's involvement was by Kingsmoor Bat Consultancy in August / September 2006. In addition to internal inspections of buildings in the former processing area and of tunnels along New England Hill, dusk transects were also undertaken at this time. The SLR transect survey commenced in summer 2008 and six surveyors were deployed to cover six distinct areas:

- A. The former processing area;
- B. Southwood Woods (east);
- C. The eastern edge of the quarry void and former stockpile areas;
- D. The bottom of the quarry void;
- E. The quarry benches;
- F. The top of the quarry void (west);
- G. Challonsleigh Planatation;
- H. Swainstone Hams (2008 only); and
- I. Woodland along the River Yealm corridor.

⁵ Please note that the mitigation strategy for the development is provided in Chapter 12 of the Environmental Statement

⁶ Note that in 2008-09 it was common practice to undertake desk studies for bats within a 2km radius of a potential development site; the normal radius is now 5km for most species and up to 15km for long-ranging species such as barbastelle.

Whilst changes subsequent changes to the scheme design have resulted in minor alterations to transect routes between the 2008-09 surveys, the main area of woodland through which the proposed access road would run was surveyed on seven occasions between April and October during 2008-2009. Note that the exact route of Transect I (the transect that most closely matches the position of the existing access route) lies just west of the current line of the route.

Bat activity patterns were mapped on a monthly basis and were presented as a series of plans (3 – 6 in Appendix report 12.4). Table 1 Table 2 summarises findings from the 2008-09 survey.

Table 2 – Summary of Bat Activity by Species

Survey	C.pip	BLE	Myotis	Noc	GHS	LHS	Barb	S.pip	Ser	Leis	Total
May	144	5	60	13	1	2	-	-	-	-	225
June	86	4	36	69	1	2	-	-	-	-	198
July	70	8	27	23	1	2	1	3	1	3	139
August	96	14	33	7	1	-	2	-	4	-	157
September	45	10	66	3	-	3	-	1	1	4	133
Total	441	41	222	115	4	9	3	3	6	7	

Four bat species (or species groups such as *Myotis* bats) were regularly recorded and these were widespread across the site; namely common pipistrelle, long-eared, noctule and *Myotis* sp. Other species (soprano pipistrelle, lesser horseshoe, greater horseshoe, barbastelle, serotine and Leisler's) were recorded only very occasionally as solitary passes (note that of these species, two – the horseshoe bats – do not use tree roosts). Most notably, out of the twelve species confirmed using the site over the seven months of survey work, the data include only three records of barbastelle, only one of which was found outside the main quarry void (see Plan 7, Report 12.4); along a former haul road where a commuting bat was recorded before dawn in July 2009. [Nb. These findings are consistent with the 2006 and 2011 surveys - i.e. that the woodland through which the proposed access route would run supports very low numbers of barbastelle and strongly indicates that a maternity roost is absent from this area].

Species other than barbastelle that also use tree roosts include *Myotis*, long-eared and Noctule bats. *Myotis* bats were recorded foraging along the River Yealm throughout the active survey season (see Plan 5, Appendix 12.4) in 2008-09; of these species, Daubenton's, whiskered / Brant's, and Natterer's were all thought to have been present, with Daubenton's appearing to be the most frequent species along the river. The same species were also reported by Kingsmoor Bat Consultancy in 2006. Small numbers of *Myotis* bats used the former haul road in Transect I, which suggests that these species may occasionally roost in trees in the vicinity of the proposed access road or alongside the River Yealm. *Myotis* sp. bats were also recorded very early along the River Yealm (sometimes at or just after sunset) suggesting that this darkened corridor provides a safe place for bats to commute into in order to forage following emergence from tree and building roosts. [Nb. small numbers of *Myotis* bats were found to be present during transect, detector and emergence / dawn studies in 2011, but numbers were very low there was no evidence of roosting in any of the affected trees].

In 2008-09, noctule foraged almost exclusively over the quarry void and former weighbridge area and there was no evidence of a roost in the vicinity of Transect I. Commuting bats were noted high above the site early in the evening during several of the survey sessions; however, no directional trend was noted to suggest that a maternity roost was present in any of the trees on site.

Long-eared bat foraging activity was focussed around woodland and scrub across the former quarry - particularly in the southern half of the site (see Plan 6, Appendix 12.4). A few registrations were recorded within Transect I, within woodland but close to the River Yealm and its tributary (which runs through Strashleigh Hams). A notable change in activity was recorded in August, when activity became more strongly focused on the quarry void; this is an atypical habitat for long-eared bats which are generally associated with well-vegetated habitat. It is likely bats were modifying their behaviour to utilise a temporary source of food available in the quarry void at this time. Long-eared bats were rarely observed due to their behaviour of late emergence and fluttering flight close to vegetation; it was therefore difficult to ascertain direction of flight and infer commuting routes and / or possible roost sites.

In summary, with respect to barbastelle in the northern part of the site, close to the current line of the proposed access route, only one record was noted in over 17 hours of survey (on Transect I). Over 200 hours of survey work was conducted across the wider site during 2008 and 2009 and during this period only three records of barbastelle were made in total.

3.2 2010: Woodland NVC survey including estimate of % trees suitable for bats

The results of this survey are contained in the SLR report entitled: Phase II Woodland Habitat and Bat Survey (October 2010). This report was submitted as part of the R19 requirement for additional survey information; it comprised the results of an National Vegetation Classification (NVC) survey of woodland habitat through which the proposed access track would run (and elsewhere within the site). In addition to describing woodland stands as NVC community types, the aim of the survey was also to undertake a ground-based visual appraisal of the proportion of trees within each woodland stand that had potential value for roosting bats.

3.3 2011: Bat Tree Roost Surveys (climbing inspections)

The results of this survey are contained in an SLR report entitled: Bat Tree Roost Surveys (June, 2011). This work was undertaken following a request from the County Ecologist for additional information, over and above that supplied by the R19 request, on potential tree roosts in areas of woodland likely to be affected by the footprint of the scheme. The following request was made in an email from the County Ecologist on the 15 March 2011:

"..a visual assessment of trees lost to the development should be carried out ASAP in order to identify whether any are category 1 or 2a, and therefore whether further survey work is required prior to determination".

It is understood that in response to this request, a survey was undertaken comprising a methodology agreed beforehand with the County Ecologist: (i) identification on the ground (using pegs) of the proposed access route (since this is the main feature of the development that would result in tree loss). Once the route was pegged, a detailed ground-based visual inspection was undertaken by a licensed bat surveyor during a site walkover. Trees within and those whose canopy encroached on the route of the proposed access track, including areas of proposed embankments at the proposed river crossing point, were subject to detailed inspections from ground level. The remaining woodland was also inspected and a precautionary approach was taken to survey (estimated using map data as the wider footprint of the development had not been marked out on the ground). Each tree with

potential to support bats was tagged and then classified according to the survey protocol contained in Appendix A of the survey report (which was itself based on BCT, 2007). Category 2a trees, difficult to view trees and those covered in ivy were then climbed by a bat ecologist and / or bat-trained arborist (the latter under the supervision of the bat ecologist) to determine whether any evidence of bats was present (such as droppings, scratch marks, fur and urine staining at entrances, smell etc). Endoscopes and other suitable items of equipment were used to assist surveyors.

Whilst the visual inspection found no actual roosts (Category 1 trees) it did assign Category 2a to around 20 trees along or adjacent to the line of the access route as a result of the features found to be present in these trees. In addition to the climbed survey, two trees (an ash 0794 and a goat willow 0787) were found to have complex cavities thus these specimens could not be inspected thoroughly; they were subsequently subject to remote bat detector surveys during mid May using Anabats (15th/16th May). This survey did not record evidence of roosts at either tree. Results are tabulated in Table 3-1 on page 4 of the June 2011 report.

3.4 2011: Dawn-dusk survey of two trees along proposed access road

The SLR report entitled: Bat Survey Report - Tree Surveys July 2011 presents results of an additional dusk-dawn survey on the aforementioned two trees (0794 and 0787) by SLR bat ecologists on the 13 July 2011. These trees were re-surveyed in addition to the remote detector work, for thoroughness.

In addition to the dusk-dawn survey of these trees, transect work commenced along the line of the proposed access route in order to gauge levels of bat activity and determine if possible whether significant concentrations of bats were present that could indicate possible maternity roosts nearby.

No bats were recorded leaving from or returning to the trees in question during the survey and only very low levels of bat activity were recorded during the transect survey. The only species recorded during the transect walk were small numbers of Daubenton's and common pipistrelle bats that foraged across the river at the proposed track crossing point. Away from the river, within the woodland section of the route, surveyors recorded only nine records of common pipistrelle, two records from long-eared bat and a single *Myotis* record. No barbastelle bats were recorded.

3.5 2011: BCT Woodland Bat Survey transect survey; dusk-dawn survey; further climbing inspections of affected 2a trees

Subsequent to the bat survey work described above, SLR ecologists have undertaken a considerable amount of additional survey work in an attempt to determine whether roosts are likely to be present in affected trees; the majority of which lie along the route of the proposed access route. Work was undertaken during mid August to mid September 2011. The resultant survey data is presented in Tables 3 to 5 below. The transect survey was undertaken in accordance with the BCT Woodland Bat Survey protocol and thus is in line with the approach requested by the National Park Ecologist.

Table 3 of the report presents results of the three transect survey sessions along the line of the proposed woodland section of the access route. Note that these three transects were undertaken in addition to the transect survey in mid July (the results of which are described in 3.4 above). During this work surveyors were briefed in particular to search for evidence that barbastelle might be roosting in trees along and close to the line of the proposed route. Barbastelle was recorded on only three occasions, despite a total of over 185 hours of survey time being logged. The records were noted in the vicinity of Tree 384 and comprised

a commuting pass from an unidentified bat (possibly barbastelle) around 35 minutes after sunset at 21:45 and two unconfirmed calls (again possibly from barbastelle) around 2 and 1 hour before sunrise. However, no bats were seen emerging from or returning to this tree by surveyors and there is no evidence that the tree is used as a roost. Note that during a follow up climbing survey in September 2011, the tree was re-inspected in closer detail and few suitable cavities appeared to be present; accordingly it was re-classified as 2b.

Most bat passes were recorded over the river corridor and these were mainly from common pipistrelles; data are consistent with the 2008-2009 transect survey results as well as with results of the mid July 2011 transect.

Table 4 of the report shows the results of three dusk-dawn sessions (emergence/re-entry survey) on all the 2a trees likely to be affected by felling or surgery. The results are again clear and support the results of the transect surveys between mid July and 1 September; i.e. there was no evidence any of the surveyed trees were being used by roosting bats in 2011. One (unconfirmed) barbastelle call was recorded close to tagged tree (0786) on the 31 August, but this was two hours before local sunrise; there was no evidence to indicate this bat was roosting in the tree in question.

Table 5 of the report is a composite table setting out the results of a second climbing inspection on the 2a trees likely to be affected by felling / surgery; it compares the September 2011 results to the results of the April 2011 climbing inspection. The outcome is consistent with the mid July to mid September transect and dusk-dawn work; there is no evidence that any of the surveyed trees are currently being used as bat roosts. The only tree where there was any evidence at all to suggest possible roosting was tree 0664 (an ash) where a single pipistrelle was recorded flying close by just after dusk on the 31 August 2011 in the vicinity of tree 384, where three calls, possibly from barbastelle, were noted during the dusk-dawn survey. There is no evidence that these four records were from bats roosting in affected trees however and it would not be possible to apply for a Habitats Regulations licence on the basis of these findings.

Table 3 – Results of BCT Woodland Bat Survey along proposed access route

Note: Temperature is measured in degrees Celsius; Wind force is based on the Beaufort Scale and cloud cover is measured in eighths.

Transect	Date	Start	Finish	Sunset	Temperature		Wind		Cloud cover		Notes
					Start	Finish	Start	Finish	Start	Finish	
River	08/08/11	21:15	22:25	20:49	14.3	13.8	0	0	3	3	No B bar passes. Majority of passes were P pip foraging along river with occasional M sp.
River	16/08/11	20:34	22:34	20:34	15.2	14.1	0	0	4	4	No B bar passes. Constant activity from small numbers of P pip & M sp foraging along river from sunset.
River	01/09/11	20:03	22:03	20:03	16.5	13.6	1	1	0	0	No B bar passes. Regular foraging by M sp, P pip & P pyg along river
Woodland	08/08/11	21:15	22:25	20:49	14.3	13.8	0	0	3	3	No B bar passes. Passes from M sp, P sp & P sp recorded throughout survey but only rarely.
Woodland	16/08/11	20:34	22:34	20:34	15.2	14.1	0	0	4	4	No B bar passes. Very little activity away from river – a few P pip & M sp passes.
Woodland	01/09/11	20:03	22:03	20:03	16.5	13.6	1	1	0	0	No B bar passes. Single N noc & a few P pip passes.

Table 4 – Results of dusk-dawn survey work on affected 2a trees

Tree tag #	Date	Start	Finish	Sunrise/ Sunset	Temperature		Wind		Cloud cover		Notes
					Start	Finish	Start	Finish	Start	Finish	
0384	22/08/11	20:05	22:20	20:20	20	15	0	0	7	7	No emerging bats observed. Unidentified commuting pass @ 21:45.
0384	23/08/11	04:20	06:20	06:20	13	14	0	0	6	6	No roosting/returning bats observed. Unidentified commuting passes @ 04:44 & 05:27
0384	13/09/11	04:50	06:50	06:48	13.1	12.7	0	0	?	8	No roosting/returning bats observed. Single M sp, PI sp, P pip & N no passes (last 06:02)
0389	22/08/11	20:05	22:20	20:20	20	15	0	0	7	7	No emerging bats observed. Single P sp pass @ 21:29
0389	23/08/11	04:20	06:20	06:20	13	14	0	0	6	6	No roosting/returning bats observed. A few M sp passes (last 05:39)
0389	16/09/11	04:53	06:53	06:53	14	15	0	0	2	7	No roosting/returning bats observed. A few P pip, PI sp & M sp passes (last 06:34)
0664	31/08/11	19:48	22:03	20:03	15	14	0	2	6	1	P pip seen @ 20:21 which <u>may have</u> emerged from tree (but unconfirmed). A few P pip & P pyg passes made thereafter & 1 R fer pass @ 20:51
0664	01/09/11	04:29	06:29	06:29	14	15	2	2	2	3	No roosting/returning bats observed. Several M sp & P sp passes (last 06:03)
0664	15/09/11	05:12	06:51	06:51	7	9	0	0	1	5	No roosting/returning bats observed.
0475	22/08/11	20:05	22:00	20:22	20	15	0	0	7	7	No emerging bats observed. A few P pip & PI sp passes (first 21:02)
0475	23/08/11	04:20	06:20	06:20	13	14	0	0	6	6	No roosting/returning bats observed. A few P pip passes (last 05:32)
0475	13/09/11	04:48	06:48	06:48	13	14	1	1	1	2	No roosting/returning bats observed. A few P pip passes (last 05:45)
0476	30/08/11	19:50	22:05	20:05	14	11	0	0	6	1	No emerging bats observed. A few P pip passes (first 21:00)
0476	31/08/11	04:28	06:28	06:28	9	8	0	0	6	1	No roosting/returning bats observed. Single P pip pass (04:40)
0476	22/09/11	05:02	07:02	07:02	12	11	0	1	2	4	No roosting/returning bats observed. Single PI sp, N no & P pip passes (last 06:00)
0775	25/08/11	20:01	22:16	20:16	15	14	0	0	7	7	No emerging bats observed. Single unidentified pass (21:10)
0775	26/08/11	04:20	06:20	06:20	13	12	1	1	8	8	No roosting/returning bats observed. Two M sp passes (last 04:51)
0775	20/09/11	04:59	06:59	06:59	14	14	3	3	8	8	No roosting/returning bats observed. Single M sp @ 05:13

Tree tag #	Date	Start	Finish	Sunrise/ Sunset	Temperature		Wind		Cloud cover		Notes
					Start	Finish	Start	Finish	Start	Finish	
0776	25/08/11	20:01	22:16	20:16	15	14	0	0	7	7	No emerging bats observed.
0776	26/08/11	04:20	06:20	06:20	13	12	1	1	8	8	No roosting/returning bats observed.
0776	21/09/11	05:00	07:00	07:00	12	11	0	0	8	8	No roosting/returning bats observed. A few M sp passes (last 05:38)
0778	31/08/11	19:48	22:03	20:03	15	14	0	2	6	1	No emerging bats observed. A few PI sp & M sp passes (first 20:44)
0778	01/09/11	04:29	06:29	06:29	14	15	2	2	2	3	No roosting/returning bats observed. A few PI sp & M sp passes (last 05:38)
0778	22/09/11	05:08	07:01	07:02	12	11	0	1	2	4	No roosting/returning bats observed. A few P pip & M sp passes (last 06:12)
0784	26/08/11	19:59	22:14	20:14	13	12	1	1	7	7	No emerging bats observed. Single PI sp & M sp passes (first 20:59)
0784	27/08/11	04:22	06:22	06:22	12	13	0	0	7	7	No roosting/returning bats observed.
0784	23/09/11	05:03	07:03	07:03	9	6	0	0	2	8	No roosting/returning bats observed. Single P pip & PI sp passes (last 06:10)
0785	26/08/11	19:59	22:14	20:14	13	12	1	1	7	7	No emerging bats observed. Single M sp & N sp passes (first 21:27)
0785	27/08/11	04:22	06:22	06:22	12	13	0	0	7	7	No roosting/returning bats observed. Single N sp pass @ 05:59
0785	21/09/11	05:08	07:00	07:00	12	11	0	0	8	8	No roosting/returning bats observed. A few P pip, PI sp & M sp passes (last 05:57)
0786	30/08/11	19:55	22:10	22:05	14	11	0	0	6	1	No emerging bats observed. A few M sp or PI sp passes (first 21:00)
0786	31/08/11	04:13	06:28	06:28	9	8	0	0	1	6	No roosting/returning bats observed. A single possible B bar pass @ 04:33 (unconfirmed) but no evidence it was using trees in the vicinity.
0786	23/09/11	05:08	07:03	07:03	9	6	0	0	2	8	No roosting/returning bats observed. A few M sp passes (last 05:57)
0787	17/06/11	04:40	06:10	06:08	12.3	12.3	0	0	6	5	No roosting/returning bats observed. A few P pip & single M sp passes
0787	13/07/11	21:05	22:55	21:24	13.7	11.3	0	0	0	0	No emerging bats observed. A few P pip & single N sp, PI sp & M sp passes (first 21:32)
0787	14/07/11	04:45	05:35	05:21	11.3	5.6	0	0	0	0	No roosting/returning bats observed.
0790	30/08/11	19:50	22:05	22:05	14	11	0	0	6	1	No emerging bats observed. P sp/M sp foraging distantly/nearby (first 20:32)
0790	31/08/11	04:28	06:28	06:28	9	8	0	0	1	6	No roosting/returning bats observed.
0790	16/09/11	04:53	06:53	06:53	14	15	0	0	2	7	No roosting/returning bats observed. A few P pip, M sp, & PI sp passes
0791	25/08/11	04:19	06:19	06:19	13	12	1	1	7	7	No roosting/returning bats observed. A few M sp passes (last 05:25)

Tree tag #	Date	Start	Finish	Sunrise/ Sunset	Temperature		Wind		Cloud cover		Notes
					Start	Finish	Start	Finish	Start	Finish	
0791	01/09/11	19:47	22:02	20:02	17	14	1	0	2	4	No emerging bats observed. A few P pip, P pyg, M sp & N no passes (first 20:50)
0791	19/09/11	05:40	07:00	06:57	12.3	12	0	0	?	8	No roosting/returning bats observed. Single M sp pass (05:45)
0792	25/08/11	04:22	06:22	06:19	13	12	1	1	7	7	No roosting/returning bats observed. A few PI sp/M sp passes (last 05:00)
0792	01/09/11	19:48	21:48	20:02	17	17	1	0	2	4	No emerging bats observed. A few P sp & M sp passes (last 21:45)
0792	20/09/11	04:59	06:59	06:59	14	14	3	3	8	8	No roosting/returning bats observed. A few P pip, M sp, & PI sp passes
0793	26/08/11	19:59	22:14	20:14	13	12	1	1	7	7	No emerging bats observed. Several P pip, P pyg, M sp, & PI sp passes
0793	27/08/11	04:22	06:22	06:22	12	13	0	0	7	7	No roosting/returning bats observed. A few P pip, M sp & PI sp passes
0793	19/09/11	05:40	07:00	06:57	12.3	12	0	0	?	8	No roosting/returning bats observed. A few M sp & P pip passes (last 05:54)
0794	17/06/11	04:40	06:10	06:08	12.3	12.3	0	0	6	5	No roosting/returning bats observed. Low levels of P sp & M sp activity over river
0794	13/07/11	21:09	22:55	21:24	13.7	11.3	0	0	0	0	No emerging bats observed.
0794	14/07/11	04:50	05:36	05:21	11.3	5.6	0	0	0	0	No roosting/returning bats observed.
0795	23/08/11	20:05	22:20	20:20	13	13	0	1	8	8	No emerging bats observed. Numerous P pip & M sp passes & a few PI sp passes (first 20:52)
0795	24/08/11	04:17	06:17	06:17	11	9	0	1	6	6	No roosting/returning bats observed. A few M sp & P pip passes (last 05:20)
0795	14/09/11	04:50	06:50	06:50	12	12	1	0	4	3	No roosting/returning bats observed. A few M sp passes (last 05:53)
0796	23/08/11	20:05	22:20	20:20	13	13	0	1	8	8	No emerging bats observed. A few M sp passes (first 21:19)
0796	24/08/11	04:17	06:17	06:17	11	9	0	1	6	6	No roosting/returning bats observed. Single M sp/PI sp pass @ 04:44
0796	15/09/11	05:12	06:51	06:51	7	9	0	0	1	5	No roosting/returning bats observed.
0798	23/08/11	20:05	22:20	20:20	13	13	0	1	8	8	No emerging bats observed.
0798	24/08/11	04:17	06:17	06:17	11	9	0	1	6	6	No roosting/returning bats observed. 1 PI sp pass @ 04:44
0798	14/09/11	04:50	06:50	06:50	12	12	1	0	4	3	No roosting/returning bats observed.

Table 5 – Results of April and September climbing inspections

ACCESS TRACK				
Tag No.	Species	Initial Inspection Category & Details	April 2011 Climbing Inspection Result/comment	September 2011 Climbing Inspection Result comment
0800	Goat Willow	2b Multi-stemmed tree with some old wounds and loose bark	Not climbed	
0799	Hazel	2b Coppice with some ivy and occasional small rot holes	Not climbed	Category 2b status retained. Has potential for most bat species; may have potential for barbastelle so climbed; however note that barbastelle generally favour species such as oaks (C Vine, pers comm.) and whilst these bats could use smaller trees such as hazel, it would in fact be rather unusual. A full physical inspection was possible, but there was no evidence of bat use.
0798	Beech	2a Tree with large spreading crown. Cavities and branch union within canopy.	Climbed. No signs of bats present. However the tree remains 2a due to the presence of roosting structures.	Climbed (and also subject to dawn-dusk survey – see above). A full inspection was possible, but there was no evidence of bat use. Category 2a status retained.
0797	Oak	2b Some ivy present	Not climbed	Category 2b status retained.
0796	Holly	2a Adjacent to ditch, with horizontal low level branch. Rot and damage at 5m height on upright trunk.	Climbed. No signs of bats present. However the tree remains 2a due to the presence of ideal roosting structures.	Climbed and full inspection possible, but no signs of bat use. Category 2a retained.
0795	Ash	2b Three stemmed tree adjacent to river. Ivy and canker present.	Poor for most bat species, possibly some potential for barbastelle.	Climbed and assessed as having only medium potential for most bat species, but could be used by barbastelle. A full inspection was possible, but no signs of bat use were found, <u>Upgraded to Category 2a and subject to dawn-dusk survey.</u>
0794	Ash	2a Coppice with long healed split along length of trunk. Directly adjacent to river.	Complex cavity, not possible to adequately survey using endoscopes etc. Dawn survey work would be required.	Climbed, but a full inspection was not possible due to the complex nature of the tree cavity. No evidence of bat use was found at the accessible points of the cavity; the tree was subject to dusk-dawn surveys during July 2011 but no evidence of roosting bats was found. Retains Category 2a status.
0793	Ash	2b Ivy clad.	Poor for most bat species, some potential for barbastelle.	Assessed as having potential for most bat species, including some potential for barbastelle. Climbed again and a full inspection was possible; there was no evidence of bat use. On closer inspection few suitable cavities were found.

				Category 2b retained.
0792	Beech	2a Cavity present on main trunk.	Climbed. No signs of bats present. However the tree remains 2a due to the presence of ideal roosting structures.	Climbed and a full inspection possible; there was no evidence of bat use. Category 2a retained.
0791	Ash	2b Ivy clad.	Poor for most bat species, considered to have some potential for barbastelle.	The tree has moderate potential for most bat species, and also potential for barbastelle. Climbed, and a full inspection possible; no signs of bat use were found. Subject to dawn and dusk surveys. <u>Upgraded to Category 2a</u>
0788	Beech	2b Some wounds and small cavities.	Not climbed	Medium potential. Category 2b retained
0789	Beech	2b Small cavities on trunk.	Not climbed	Medium potential. Category 2b retained
0790	Ash	2a Hollow trunk.	Climbed. No signs of bats present. However the tree remains 2a due to the presence of ideal roosting structures.	The tree was climbed and a full inspection was possible; no signs of bat use were found. Category 2a status retained.
0787	Goat Willow	2a Large broken/half fallen trees with hollows, fractures and cracks.	Climbed. No signs of bats present at accessible portions. However, due to the complex cavities present, not possible to adequately survey using endoscopes etc. Dawn survey work would be required.	The tree was climbed but a full inspection was not possible due to the complex nature of the cavity. There was no evidence of bat usage at accessible parts and a dusk-dawn survey was undertaken to determine bat status during July 2011. No evidence of bats was found. Category 2a retained.
0384	Ash	2b Ivy clad.	Poor for most bat species, possibly some potential for barbastelle (although note species preference for oaks).	Moderate potential for most bat species and possibly potential for barbastelle. Climbed and a full inspection possible, but no evidence of bat use. On closer inspection few suitable cavities appeared to be present. Category 2b retained.
0786	Hazel	2b Ivy clad, with some areas of rot.	Poor for most bat species, some potential for barbastelle.	Moderate potential for most bat species and some potential for barbastelle (Although note comments above re tree roost preferences for this species and likelihood of using trees such as hazel). The tree was climbed and a full inspection was possible, but no evidence of bat use was found. <u>Upgraded to Category 2a</u> : subject to dawn–dusk but no evidence of bats found.

0389	Ash	2a 3-stems, hollow present on the thinnest one	Climbed. No signs of bats present. Found to be poor for most bat species, but has some potential for barbastelle.	Climbed and a full inspection possible; no evidence of bat use. Category 2a status retained.
0781	Beech	2b Small wound and limited amounts of rot	Not climbed	Has moderate potential. Category 2b retained.
0780	Ash	2b Multi-stemmed and ivy clad.		Moderate potential for most bat species and potential for barbastelle. Climbed and a full inspection possible; there was no evidence of bat use and on closer inspection few suitable cavities were noted. Category 2b retained
0785	Ash	2b Multi-stemmed with ivy and some splits.	Poor for most bat species, some potential for barbastelle.	Moderate potential for most bat species and some potential for barbastelle. Climbed and a full inspection possible; there was no evidence of bat use. <u>Upgraded to Category 2a and subject to dawn-dusk; no evidence of bat use.</u>
0784	Ash	2b Multi-stemmed and ivy clad.	Poor for most bat species, some potential for barbastelle.	Moderate potential for most bat species and some potential for barbastelle. Climbing inspection not possible due to lack of suitable anchors. There was no evidence of bat usage at the accessible parts of the tree. <u>Precautionary upgrade to Category 2a; subject to a dawn-dusk survey during which no evidence of bats was found.</u>
0778	Ash	2b Multi-stemmed tree, ivy clad.	Poor for most bat species, but possibly some potential for barbastelle.	Medium potential for most bat species and potential for barbastelle noted. Climbed and a full inspection possible, but no evidence of bat use found. <u>Upgraded to Category 2a on precautionary basis and subject to dawn-dusk; no evidence of bats found.</u>
0783	Holly	2b On old bank adjacent to path. Ivy clad	Not climbed	Medium potential. Category 2b status retained
0779	Holly	2b Ivy clad	Not climbed	Medium potential. Category 2b status retained
0777	Holly	2a. Ivy clad, with cavity at base of trunk	No signs of bats present. Re-categorise as 2b due to poor quality of cavity.	Climbed and a full inspection possible; there was no evidence of bat use. On close inspection the cavity was seen to be of poor quality. <u>Downgraded to Category 2b.</u>
0664	Ash	2b Multi-stemmed ash with some canker.	Poor for most bat species, some potential for barbastelle.	Moderate potential for most bat species, with some potential for barbastelle. Climbed and a full inspection possible; there was no evidence of bat use. <u>Precautionary upgrade to Category 2a and then subject to dawn-dusk; may have supported a single roosting pipistrelle at the end of August 2011 (although this was not confirmed).</u>
0776	Ash	2a	Climbed. No signs of	Climbed and the external ivy searched for one hour for presence of bats (during which it is

		Thick dense ivy, with deadwood and splits.	bats present. However the tree remains 2a due to the presence of ideal roosting structures.	considered that all potential roosts were located). There was no evidence of bat use. Retains Category 2a status.
0775	Ash	2a Thick dense ivy, with deadwood and splits.	Climbed. No signs of bats present. However the tree remains 2a due to the presence of ideal roosting structures.	Climbed and a full inspection possible; there was no evidence of bat use. Retains Category 2a status.
0457	Holly	2b Growing on bank. Crossing stems.	Not climbed	Moderate potential only. Retains Category 2b status.
0461	Ash	2b Adjacent to path. Ivy clad.	Not climbed	Moderate potential only. Retains Category 2b status.
0462	Beech	2b Adjacent to path. Ivy clad.	Not climbed	Moderate potential only. Retains Category 2b status.
0651	Oak	2b Leaning over stream. Ivy clad.	Not climbed	Moderate potential only. Retains Category 2b status.
0649	Sycamore	2b Adjacent to stream. Ivy clad.	Not climbed	Moderate potential only. Retains Category 2b status.
0476	Sycamore	2b Close to pylons at north of woodland. Sections of dead ivy.	Climbed. Poor for most bat species, possibly some potential for barbastelle.	Moderate potential for most bat species and some potential for barbastelle. Climbed; a full inspection was possible but there was no evidence of bat use. Precautionary upgrade to Category 2a; subject to dawn-dusk but no evidence of bats.
0475	Sycamore	2b Close to pylons at north of woodland. Ivy clad.	Climbed. Poor for most bat species, some potential for barbastelle.	Moderate potential for most bat species and potential for barbastelle. Climbed and a full inspection was possible, but there was no evidence of bat use. Precautionary upgrade to Category 2a; subject to dawn-dusk but no evidence of bats.
Remaining Site				
Tag No.	Tree Species	Initial Inspection Category & Details	Additional survey undertaken/needed	
0774	Sycamore	2b Some ivy and split dead ends.	Not climbed	Medium potential. Category 2b status retained.
0773	Sweet Chestnut	2b Some ivy and split dead ends.	Not climbed	Medium potential. Category 2b status retained.
0772	Sweet	2b	Not climbed	Medium potential.

	Chestnut	Some ivy and split dead ends.		Category 2b retained.
0771	Oak	2a Cavity in trunk at 3m.	Climbed. No signs of bats present. Re-categorise as 2b due to poor quality of cavity.	Climbed and a full inspection possible; there was no evidence of bat use. Cavity remains poor quality as previously: <u>Confirm down-grade to Category 2b.</u>
0770	Oak	2b Some ivy and split dead ends.	Not climbed	Medium potential. Category 2b retained.
0769	Oak	2b Some ivy and split dead ends.	Not climbed	Medium potential. Category 2b retained.
0768	Oak	2b Some ivy and split dead ends.	Not climbed	Medium potential. Category 2b retained.
0767	Beech	2b Hollow at base.	Not climbed	Medium potential. Category 2b retained.
0766	Oak	2b Some ivy and split dead ends.	Not climbed	Medium potential. Category 2b retained.
0765	Beech	2a. Wounds and branch union at height.	Climbed. No signs of bats present. However the tree remains 2a due to the presence of ideal roosting structures.	Climbed and a full inspection possible no evidence of bat use. Retains Category 2a status.
0764	Sycamore	2b. Long cavity; no evidence no bats.	Not climbed	Moderate potential only. Category 2b retained.
0763	Beech	2b Wound on trunk.	Not climbed	Medium potential. Category 2b retained.
0762	Sycamore	2a Very thin tree with small opening at 0.5m height leading to hollow trunk.	No signs of bats present. However the tree remains 2a due to the presence of roosting structures.	No evidence of bat use and cavity now well-blocked by vegetation. <u>Downgrade to Category 2b.</u>
0761	Oak	2b Ivy clad	Not climbed	Medium potential.

				Category 2b retained.
0760	Goat willow	2b. Ivy clad with some rotten parts	Not climbed	Medium potential. Category 2b retained.
0759	Oak	2b Ivy clad.	Not climbed	Medium potential. Category 2b retained.

4.0 CONCLUSIONS

A considerable amount of bat survey has now been undertaken at this site, including two climb and inspect sessions on 2a trees in April and again in September 2011; four transect survey sessions totalling approximately 24hrs survey time between mid July and early September 2011 (this is over and above the required three sessions to meet the BCT Woodland Bat Survey NBMP guidance criteria) as well as over 160hrs of dawn-dusk sessions on all affected 2a trees (three sessions in total on each tree and five sessions on the two trees that could not be properly checked during climbing surveys).

The results of the surveys are quite clear - in particular when the data are assessed alongside the results of work undertaken in 2008-2009 – that bat activity in the woodland through which the proposed access route would run is low compared to other sections of the site and there are few records of barbastelle. Indeed, a total of only seven passes have been recorded for this species since 2008 across the entire site, with only five records from the affected woodland area since 2008. This is a very low number of records given over 200 hours of surveys have been expended in this part of the site alone.

The results of the 2011 survey, particularly when assessed alongside the work undertaken in 2008-2009, enables some conclusions to be drawn in respect of the following questions (a) whether any of the affected trees are used by roosting bats (b) whether the development proposals would have a negative effect on Dartmoor bat species, in particular on the maternity colony of barbastelle bats known to occur around Dendles Wood and (c) whether the proposed severance of the woodland (by the access track) and the loss of potential roost trees would have an impact on the ability of barbastelle bats to commute, forage and roost in this woodland. Each of the above questions is addressed in turn:

With regard to the first question - whether the 2a trees are used by roosting bats – it seems reasonable to conclude that there have been no maternity roosts present in trees in the vicinity of the proposed access track during summer 2011; if such roosts were present, the transect surveys that commenced in mid-July 2011 (and which followed the BCT National Bat Monitoring Programme protocol for detecting woodland bats) would have been expected to have recorded locally elevated levels of bat activity; in fact the reverse is true – bat activity has been consistently low in this area throughout the 2011 study and also during the 2008-09 survey work. Whilst the presence of individual tree-roosting bats cannot be ruled out (low level roosts would be extremely difficult to detect) the level of survey so far expended is more than sufficient to be confident that no significant roosts were present in affected trees during 2011.

The second question is whether the proposals would have a negative effect on Dartmoor bat species, in particular on the maternity colony of barbastelle bats that are known to occur around Dendles Wood SSSI. The 2003 survey report by G Billington shows that whilst the tracked bats used the lower Yealm corridor periodically, the New England Quarry site lies on the western periphery of this species foraging area. The data collected in 2008-2009 and in 2011 support this and the conclusion drawn from the bat surveys along the route of the proposed access track strongly indicates that barbastelle use the affected habitats only at very low level and the species local status would therefore not be negatively affected.

The final question is whether the construction of an access track some 10m in width would have a severance effect on local bat populations; in particular on barbastelle bats. As has already been made clear, bat numbers in the woodland through which the route would run appear low and in any case 10m width would not present a barrier to bat movement. Andrew McCarthy Associates undertook detailed studies between 2007 and 2010 on possible habitat fragmentation effects associated with construction of a gas pipeline through the hedged

habitat of Devon; this work could find no evidence at all that bats were unable or unwilling to cross hedge gaps of up to 15m in width. Barbastelle bats are also known to cross open fields when commuting, so it is highly unlikely that a relatively narrow cutting through a woodland such as this would present a barrier. Indeed it is quite possible that the progressive growth of scrub along track margins would eventually turn this feature into a linear 'glade' which could result in this part of the woodland area being enhanced for foraging bats as a result of the increased niches for insect prey.

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6.0 CLOSURE

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