

**Conservation of Habitats and Species
Regulations, 2017**

HABITATS REGULATIONS ASSESSMENT



Stage 1: Habitats Regulations Assessment - Screening of likely significant effect on a European site

Part A: The proposal

1. Type of permission/activity:	Full
2. Application reference no:	2017/1022/CNT
3. Site address:	Halecombe Quarry, Leigh On Mendip, Somerset
4. Brief description of proposal:	<p>Deepening of Halecombe Quarry by the extraction of limestone, replacement of existing asphalt plant with a new asphalt plant and associated facilities, retention of the concrete batching plant and the reopening of the access road to Rookery Farm with relinquishment of the existing permission and extension of end date for the entire quarry and all quarrying activities to 31 December 2044.</p> <p>It is proposed that extraction will take place in six phases to enable the additional reserves to be worked. Phase 1 is the current permitted extraction.</p> <p>Phase 2a (years 2 to 5) Quarrying to level 6 Relocation of old substation & cables Removal of access ramp to old substation Development of e faces Removal of old primary crusher footing & regrading of screening bund Completion of southern screening bund Construction of historic access road Removal of concrete plant & movement of rap processing site Development of levels 1-3 below old rap processing site Raising of w screening landform Rookery Farm void final extraction & flooding to create balancing lagoon</p> <p>Phase 2b (years 6 to 8) Part culverting of Halecombe Brook Infilling of settlement lagoon Quarrying to level 7 Construction & commissioning of new asphalt plant Tipping of quarry waste to sw screening landform</p> <p>Phase 2c (years 9 to 20) Rest of culverting of Halecombe Brook Quarrying to level 7 Demolition of old asphalt plant Lateral extension below old asphalt plant Poor quality material placed into se screening landform Relocation of rap processing site</p> <p>Phase 3 (years 20 to 22) Quarrying to level 8</p>

	<p>Mineral processing & stockpiling in quarry void & at top of quarry Processing & stockpiling of rap Bench restoration/ completion of e tip</p> <p>Phase 4 (years 22 to 25) Mineral processing & stockpiling in quarry void & at top of quarry Processing & stockpiling of rap Bench restoration/ completion of e tip Quarrying to level 9</p> <p>Phase 5 (years 26 to 28) Mineral processing & stockpiling in quarry void & at top of quarry Bench restoration/ completion of e tip Quarrying to level 10</p> <p>Phase 6 (years 29 to 30) Mineral processing & stockpiling in quarry void & at top of quarry Quarrying to level 11 Regrading slopes around rookery farm void Removal of asphalt plant Reinstatement of Halecombe Brook Final restoration completed</p> <p>Following the completion of extraction, the Application Site will be restored to a mosaic of mixed woodland, orchard, scrub, rough grassland, two lakes with shallow wetland margins and hedgerow planting, as well as the retention of quarry faces which will be left to naturally regenerate with vegetation, and the reinstatement of the Halecombe Brook to its natural course and character. Restoration would be completed by 31st December 2046.</p>
Part B: The European site	
<p>5. European site name(s), Qualifying Features:</p>	<p>Mells Valley SAC</p> <ul style="list-style-type: none"> • <i>Rhinolophus ferrumequinum</i>; Greater horseshoe bat • Caves not open to the public • Semi-natural dry grasslands and scrubland facies: on calcareous substrates; Dry grasslands and scrublands on chalk or limestone <p>Mendip Woodlands SAC</p> <ul style="list-style-type: none"> • <i>Tilio-Acerion</i> forests of slopes, screes and ravines.
<p>6. Ecological characteristics associated with the features (including those associated with the site, and information on issues or sensitivities associated with the features if available).</p>	<p>Mells Valley SAC</p> <p><u>Greater Horseshoe Bats</u> Greater Horseshoe bat populations are sustained by a foraging habitat which consists primarily of permanently-grazed pastures interspersed with blocks or strips of deciduous woodland, or substantial hedgerows. Such pasture/woodland habitats can generate large levels of their favoured prey, especially moths and dung beetles, but also tipulids and ichneumonids.</p> <p>Larger hedgerows are required for commuting as well as foraging by Greater Horseshoe bats. Continuous lines of vegetation of sufficient height and thickness to provide darkness when light levels are still relatively high are needed for commuting bats.</p> <p><u>Caves not open to the public</u> The component site for this habitat is remote from the influence of the proposed development at Halecombe Quarry and is not considered further.</p>

Semi-natural dry grasslands and scrubland facies: on calcareous substrates; Dry grasslands and scrublands on chalk or limestone

The component site for this habitat is remote from the influence of the proposed development at Halecombe Quarry and is not considered further.

Mendip Woodlands SAC

The Asham Wood Site of Special Scientific Interest (SSSI), a component site of the SAC, is located on the northern boundary of the application site. Asham Wood is the largest and most diverse of the ancient semi-natural woods in the Mendips. Despite partial destruction due to quarrying it remains one of the most important. The wood occupies two deep valleys and the intervening plateau.

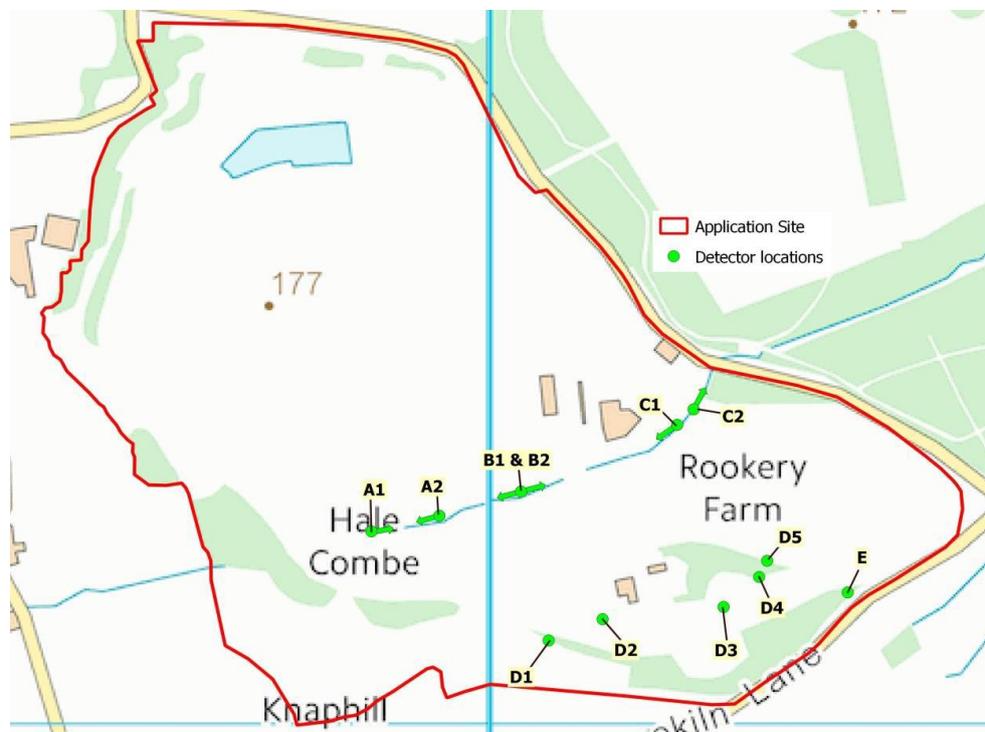
Bryophyte and lichen flora are susceptible to deposition from dust due to quarrying activity.

7. Ecological survey results for the application site:

Greater Horseshoe Bats

Surveys for bats were carried out by automated detector in 2016 by Andrews Ecology.¹ A detector was deployed at each point over 4 nights in each survey month. The results of the survey by commuting contact in Table 1 following and the locations detectors are shown in Figure 1 below.

Figure 1: Locations of Automated Detectors



The contacts for Greater Horseshoe bats were all; recorded as commuting contacts with no feeding contacts as defined by Miller's Activity Index. Andrews states that, 'In an attempt to mitigate this bias, call sequences with negative minute on either side (i.e. a minute in which the species was not recorded) are judged to be commuting contacts, whereas contacts in two consecutive minutes or more are judged to be foraging contacts. This was defined using Miller's Acoustic Activity Index (Miller 2001).'²

Greater Horseshoe bat contacts were recorded at Sample A on the west end of Halecombe Brook in September. However, at no point was the species recorded at Samples B or C which suggests the species did not cross the application site via the Halecombe Brook. Overall, the inference is

¹ Andrews, H, 2016. *Results of a Desk Study, Habitat 'Truthing' & Survey for Bats at Halecombe Quarry. Leigh-on-Mendip. Frome, Somerset, BA11 3RD.* Bridgwater: Andrews Ecology.

² Andrews, H, 2016. *Results of a Desk Study, Habitat 'Truthing' & Survey for Bats at Halecombe Quarry. Leigh-on-Mendip. Frome, Somerset, BA11 3RD.* Bridgwater: Andrews Ecology.

that the concrete gutter-section of the Halecombe Brook was visited by a bat or bats wishing to drink.

Table 1: Greater Horseshoe Bat Survey Results

Sample Location	May				June				July				September				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
A1															3		
A2																1	
B1																	
B2																	
C1																	
C2																	
D1									2	1							
D2													2	1	2		
D3		3								1		1	1	1			
D4													1				
D5														1	1		
E	2	2	3		3			1	1			4	2	5	1		

The 'Rookery Farmhouse' network (Sample D) recorded contacts sporadically in May, July and September. The Limekiln Lane hedge/treeline (Sample E) contacts suggest frequent usage.

In addition to the surveys carried out by Andrews Ecology radio tracking of Greater Horseshoe bats was carried out in June 2000 by Billington.³ The result of this survey is shown in Figure 2 below. The tracked Greater Horseshoe bat(s) approached from the south. No evidence of the flight corridor shown was recorded during the 2016 survey season and may have been affected by lighting subsequent to 2000. An unpublished paper (Andrews, Taton & Latham. 2011). A comparison of the spatial range of three bat detectors) includes a plan of the flight route of lesser horseshoe and brown long-eared bat exiting from Rookery Farmhouse where they pass through light spill from the east on the vegetated bund used as flight structure for about 20 metres.

Figure 2: Radio Tracking Survey (Billington, 2000)



³ Billington, G. 2000. *Radio tracking study of Greater Horseshoe bats at Mells, Near Frome, Somerset*. Peterborough: English Nature

	<p>Asham Wood A bryophyte survey⁴, which was performed on 11th October 2018 by Nick Hodgetts, of Asham Wood adjacent to Leighton Quarry. The bryophyte survey sampled a wider corridor than requested (c. 50-130 m). The key findings of the survey are:</p> <ol style="list-style-type: none"> 1. Although there is a significant biomass of bryophytes, the diversity of species is 48, which is 44% of that recorded within the wider SSSI in 2008. 2. The flora is dominated by large calcicolous⁵ species amongst which a species new to Asham Wood SSSI was recorded, comprising: <i>Cololejeunea rossettiana</i>. This tiny liverwort species is classified as Nationally Scarce (Pescott 2016) and is only found in limestone areas. 3. Many calcicolous species that are not normally epiphytes⁶ were recorded on trees that are affected by the impact of windblown limestone dust. 4. Calcifugous⁷ species are entirely absent. 5. Necrosis⁸ is present on some species near the southern boundary. All the visible evidence suggests that this is the result of windblown limestone dust originating from the adjacent quarry and settling within the woodland. 6. The pollution sensitive species <i>Leucodon sciuroides</i> was recorded. This species declined in the 20th century but may now be spreading again in some areas. It appears to have colonised Asham Wood SSSI, where it has not been recorded since 1970. 7. The visible appearance of water in a stream passing through the SSSI was turbid and milky, and the channel holds very little bryophyte growth.
<p>Part C: Screening assessment for likely significant effect</p>	
<p>8. Is this application necessary to the management of the site for nature conservation?</p>	<p>No</p>
<p>If the answer to Q9 is 'Yes' then go directly to the end of the form. Permission may be granted.</p>	<p>N/A</p>
<p>9. The identified ways in which the Qualifying Features of the European site could be affected by the proposal</p>	<p>Greater Horseshoe Bats <u>Loss / degradation of foraging habitat</u> Although the most important factor for supporting Greater Horseshoe bat populations is grazed pasture⁹ none of this land use is present within the application site. However, in June and early July, pregnant females feed on moths, their key prey at that time, and continue to do so after giving birth, until late August. They usually avoid the dung beetle <i>Aphodius rufipes</i> even when they are abundant, as long as moths are in good supply. Moth supplies usually fall steadily in August and September, due to phonological population declines, or rapidly at a particular dawn or dusk due to temporary low temperatures. If either happens adult bats switch to secondary, single prey items, or combine moths with them. Tipulids are often the first alternative, but <i>Aphodius</i></p>

⁴ Hodgetts, N. & Andrews, H. 2018. *Bryophyte Survey of the Area of Asham Wood SSSI known as 'Leighton Hanging Wood', Somerset*. Bridgwater: Andrews Ecology

⁵ Calcicolous – growing or living in soil rich in lime.

⁶ An epiphyte is an organism that grows on the surface of a plant and derives its moisture and nutrients from the air, rain and debris accumulating around it.

⁷ Calcifugous – growing or living in acid soil.

⁸ Necrosis is a form of cell injury which results in the premature death of cells in living tissue.

⁹ Ransome, R. D. 1997. *The management for Greater Horseshoe bat feeding areas to enhance population levels*: English Nature Research Reports Number 241. Peterborough: English Nature.

rufipes is also taken. It is possible that grassland and scrub habitats within the application site support populations of moth species taken by Greater Horseshoe bats. The presence of abundant butterfly-bush which attracts moths preyed upon by Greater Horseshoe bats was noted by Andrews.

Substantial broad hedgerows with frequent emergent trees can provide suitable structure for foraging conditions for Greater Horseshoe bats if woodland is scarce. A tall thick hedgerow is a very efficient way of producing a maximum level of insect prey using a minimum land area and important creators of physical conditions that enhance insect concentrations and reduce wind speeds for economical hunting flight.

Greater Horseshoe bats also feed through the winter when prey species become active, for example when *Ophian* wasps swarm in woodlands above 5°C. They have been found to spend significant times in woodland, being sheltered, often warmer at night, and insects are much more abundant than in open fields. No woodland is present on the application site although substantial amounts exist to the east of the quarry this is distant from known hibernation sites.

Severance of flight lines

Larger hedgerows are required for commuting and also foraging by Greater Horseshoe bats. Continuous lines of vegetation of sufficient height and thickness to provide darkness when light levels are still relatively high are needed for commuting bats. Watercourses can provide the same function.

Operational noise and vibration disturbance

The maternity roost is located at Wadbury House which although outside the SAC boundaries supports the conservation objectives of the designated site the former roost having been destroyed by fire. This lies approximately 4km to the north east of the quarry. There is no risk to roosting bats.

Operational light disturbance

Research suggests that preferred commuting routes for Lesser Horseshoe bats are at lux levels even lower than previously thought: "*under natural, unlit conditions ... 0.04 lux*"¹⁰ but avoid levels above 3.6 Lux. (Stone et al, 2009)¹¹ They regularly use dark hedgerows which are an average of 0.45 Lux. Stone et al (2009) stated, '*It is unsurprising that few bats flew along the unlit side of the hedge, given that light levels on the unlit side on [artificially] lit nights (mean 4.17 lux) were significantly higher than those along dark hedges (mean 0.45 lux); even these relatively low light levels may make established routes unsuitable for commuting.*' They are potentially disrupted from flying along hedgerows by introduced artificial light levels above 0.5 Lux. It was also found that continued disruption increased the effect, i.e. Lesser Horseshoe bats do not become habituated to the presence of artificial lighting. This would therefore permanently affect their behaviour possibly having a significant effect on use of flight lines accessing feeding areas. Lacking data to the contrary it is considered that Greater Horseshoe bats would react in the same way and that introduced lighting from the application site could cause behavioral changes and present a barrier to movement.

Loss of roost sites

No roosts are directly affected by the application.

Mendip Woodlands SAC

Asham Wood component site

Degradation due to air quality and dust effects

The proposed revised restoration scheme would involve the movement, tipping and stockpiling of material to fill the quarry, which is likely to generate an amount of dust into the air above that for the permitted scheme.

¹⁰ Stone, E.L 2013. *Bats and Lighting – Overview of current evidence and mitigation*. Bristol: University of Bristol.

¹¹ Stone, E. L. 2009. The impact of street lighting on lesser horseshoe bats Presented at the South West Bat Conservation Trust Conference, 25 April, 2009; Stone, E. L., Jones, G. & Harris, S. 2009. Street Lighting Disturbs Commuting Bats. *Current Biology* 19, 1123–1127, July 14, 2009

	<p>Fine particles may travel up to 1 kilometre.¹² The National Planning Policy Framework Technical Guidance¹³ states that, ‘... research carried out by Arup Environmental / Ove Arup and Partners and the University of Newcastle upon Tyne in 1995 and 1999 respectively, additional measures to control PM₁₀ might be necessary if, within a site, the actual source of emission (e.g. the haul roads, crushers, stockpiles etc.) is within 1,000m of any residential property or other sensitive use.’ Although the guidance does not consider effects on sensitive biodiversity it is considered that there are potentially effects on habitats from dust and air quality.</p> <p>The following aspects of the development have been identified that could possibly give rise to an impact on the air quality of the surrounding area:</p> <ul style="list-style-type: none"> • Excavation of limestone. • Processing of limestone. • Loading and dispatch of vehicles. • Restoration/tip material placement.
<p>10. Assessment of risks without avoidance or reduction measures</p>	<p>Greater Horseshoe Bats <u>Loss / degradation of foraging habitat</u> The 2016 automated surveys did not indicate that foraging activity by Greater Horseshoe bats was occurring within the application site. The most recorded activity was from along Limekiln Lane to the south of the quarry with occasional passes being recorded in the Rookery Farmhouse area. This is also borne out by the results of the 2000 radio tracking survey where foraging activity is concentrated to the east and south of the quarry with some activity towards the Rookery Farmhouse complex. The presence of butterfly bush seems to be negated by the existing lighting regime. Moths are also attracted to lamps putting them out of the reach of Greater Horseshoe bats.</p> <p>The loss of the concrete channel on the western end of Halecombe Brook could result in a loss of what could be a drinking resource for a Greater Horseshoe.</p> <p><u>Severance of flight lines</u> Within the application site where potential flight lines occur, these are affected by existing levels of artificial lighting which are hostile to Greater Horseshoe bats. The remaining potential for effect is in respect of the proposed reinstatement of the Rookery Farmhouse access road from Limekiln Lane. It is proposed to construct a 6-metre wide road. At this point it is likely that hedgerow would be removed for at least the width of the junction and more if visibility splays are required by Somerset Highways. However, if visibility splays are required it is likely that a new hedgerow would be planted to replace that lost albeit set back from the original line.</p> <p><u>Operational light disturbance</u> When the quarry is in operation, lux values recorded in the channel only fall below levels that bats typically tolerate at the western and eastern extremities, with the central 200 m subject to levels of between 0.4 to 5.8 lux. The consented Halecombe Quarry has a licence to operate seven days a week and working through the weekends is not unusual. Furthermore, existing large halogen security lights are typically in operation even when the site is closed, and these result in a lux of 5.4 over the western of the two road bridges for a distance of c. 50 m. Therefore, the channel can be predicted to be unattractive to commuting bats of all species.¹⁴</p> <p>Asham Wood <u>Degradation due to air quality and dust effects</u> The Asham Wood SSSI component site of the SAC lies about 660 metres south from the asphalt processing plant to its nearest point. Currently the SSSI units are all in ‘favourable condition’¹⁵</p>

¹² Environment Agency. 2004. *Habitats Directive: Work Instruction (Appendix 6: Further Guidance applying the Habitats Regulations to Waste management facilities)*. http://www.environment-agency.gov.uk/commondata/103599/52_02v3_waste_mgmt_295862.doc; Office of the Deputy Prime Minister. 2005a. *Minerals Policy Statement 2: Controlling and Mitigating the Environmental Effects of Minerals Extraction in England. Annex 1: Dust*. London: HMSO.

¹³ <http://www.communities.gov.uk/documents/planningandbuilding/pdf/2115548.pdf>

¹⁴ Andrews, H, 2016. *Results of a Desk Study, Habitat ‘Truthing’ & Survey for Bats at Halecombe Quarry. Leigh-on-Mendip. Frome, Somerset, BA11 3RD*. Bridgwater: Andrews Ecology.

¹⁵ <https://designatedsites.naturalengland.org.uk/ReportUnitCondition.aspx?SiteCode=S1003657&ReportTitle=Asham%20Wood%20SSSI>

	<p>with no reports of impacts from air quality. However, Natural England records show that acid loving bryophytes are no longer present in the wood. The likely reason for this is the deposition of limestone dust from the surrounding quarries.</p> <p>A bryophyte (moss and liverwort) survey of Asham Wood SSSI was performed in 2008¹⁶ in order to establish the current condition, at that time, of the bryophyte interest, and to consider whether limestone dust generated by quarrying might be affecting the SSSI. The survey found that bryophytes were notably abundant in Asham Wood, with most trees and boulders well-covered, especially in more sheltered areas, such as in the stream valleys (ibid.). A total of 108 species were recorded, including five Nationally Scarce species new to the SSSI, and large colonies of common calcicolous species were noted (ibid.).</p> <p>Andrews Ward Associates (2008)¹⁷ concluded that the bryophyte flora appeared to have changed to some extent over time, i.e. prior to 2008, but the characteristic calcicole flora still survived and appeared to be healthy, except for plants growing in a narrow strip immediately adjoining Torr Quarry. The report states that 'In parts of the wood near the active Torr Quarry (a marginal strip extending ca. 50 m into the wood from ca. ST700445 to ST703450), where there is clearly dust in the air and a layer settling over all surfaces, species that are normally saxicolous can be found growing on trees: for example, <i>Schistidium crassipilum</i>, <i>Tortella tortuosa</i> and <i>Tortula muralis</i>. Other epiphytes in this part of the wood exhibit some necrosis. For example, colonies of <i>Neckera crispa</i> were found with extensive dry, dead areas. Most unusually, birch in this area has a rich epiphytic flora, with <i>Cryphaea heteromalla</i>, <i>Metzgeria furcata</i>, <i>N. complanata</i>, <i>N. crispa</i>, <i>Radula complanata</i> and <i>Zygodon</i> spp. all found growing on birch trunks.'</p> <p>Andrews Ecology¹⁸ consider the deposition was not the result of quarrying <i>per se</i>, but rather due to the processing plant and wind-blow from stockpiles and much probably historic when the plant was on a shallower base.</p> <p>At the time Andrews Ward Associates did not perceive any notable effect from the Leighton Quarry edge of the SAC, although, the adjacent haul-road may have thrown-up dust, this is infrequent and small scale¹⁹.</p> <p>With this application there is the potential to generate dust during the drilling operation and during the actual quarry blast although blasting is infrequent. Loading of dump trucks and haulage of material to the processing plant also have the potential to generate dust. All extraction operations would be undertaken well below surrounding ground level and carried out in compliance with current operation controls and mitigation measures.</p>
<p>11. Conclusion of Screening stage (Is the proposal likely to have a significant effect 'alone' or 'in combination' on a European site?)</p>	<p><u>Alone:</u> Greater Horseshoe Bats <u>Loss / degradation of foraging habitat</u> Greater Horseshoe bats have individual foraging areas in which they have hunting patches of about 0.35 hectares, which are unlikely to be shared at the site's distance from the maternity roost. However, apart from the eastern edge of the quarry most of the application site lies over 4km from the maternity roost at which point foraging is likely to become opportunistic.²⁰ The loss of foraging habitat is not considered significant alone but there may be some effect if more than one Greater Horseshoe bat is using the culverted watercourse for drinking.</p> <p><u>Severance of flight lines</u> Greater Horseshoe bats will cross gaps in flight lines of up to 12 to 15 meters even when there is a low level of street lighting²¹. However, there are no details of the junction to Rookery Farm from</p>

¹⁶ Andrews Ward Associates 2008. *Bryophyte survey of Asham Wood SSSI, Somerset*. Bridgwater: Andrews Ward Associates.

¹⁷ Andrews Ward Associates 2008. *Bryophyte survey of Asham Wood SSSI, Somerset*. Bridgwater: Andrews Ward Associates.

¹⁸ Pers. Com. Henry Andrews, Email 10 April, 2018

¹⁹ Pers. Com. Henry Andrews, Email 10 April, 2018

²⁰ Ransome, R. D. 2008. Greater horseshoe bat *Rhinolophus ferrumequinum*: in Harris, S. & Yalden, D. W. (eds.) 2008. *Mammals of the British Isles: Handbook*, 4th Edition. Southampton: The Mammal Society; Rossiter, S. J., Jones, G., Ransome, R. D. & Barratt, E. M. 2002 Relatedness structure and kin-based foraging in the greater horseshoe bat (*Rhinolophus ferrumequinum*). *Behav. Ecol. Sociobiol.* (2002) 51: 510-518.

²¹ Billington, G. 2000. *Radio tracking study of Greater Horseshoe bats at Mells, Near Frome, Somerset*. Peterborough: English Nature

Limekiln Lane submitted with the application. Therefore, there is uncertainty as to whether a significant effect would occur as a result of the proposed widened access.

Operational light disturbance

Artificial light is currently abundant on the slopes surrounding Rookery Farmhouse. The proposed construction of a new asphalt processing plant and associated lorry parking and loading facilities would extend the lighting south toward Rookery Farm although topography and vegetation may provide some shielding around the roost site. However, this is unlikely to affect Greater Horseshoe bat activity which is currently limited within the quarry by existing lighting to the western end of the Halecombe Brook and the quarry's lighting generally. A significant effect is unlikely from the application alone.

Asham Wood

Degradation due to air quality and dust effects

The operation of the asphalt plant and concrete plant are subject to separate environmental permits in which the minimisation of dust is an important element. Irrespective of the grant of planning permission the plants cannot operate without individual environmental permits issued by the local environmental health department at Mendip District Council.

Asham Wood lies approximately 570m south of the Rookery on the southern edge of Halecombe Quarry and would only be potentially affected when the wind is from the north. This only occurs on average 1 in 20 days per year with 3.3 days with wind speeds of over 12mph. The Guidance on the Assessment of Mineral Dust Impacts for Planning published by the Institute of Air Quality Management (IAQM 2016) suggests the Zone of Influence in respect of dust and ecologically sensitive sites is a maximum 400m radius. There is also a hill, Knapp Hill, between the quarry and Asham Wood.

Asham Wood is unlikely to experience any impact from dust emissions arising from the proposed development as a consequence of the prevailing climatic conditions, separation distance, landform screening, difference in topographic heights and the continued use of established mitigation measures and management controls²². A significant effect is unlikely from the application alone.

In Combination:

Leighton Quarry 2017/1506/CNT

The application is principally required to allow the infilling of waste material into the neighbouring Leighton Quarry void, thereby varying the restoration scheme.

Mells Valley SAC

With regard to the Greater Horseshoe bat feature the Habitats Regulations Assessment of the application concluded that the proposal would be beneficial to the Mells Valley population.

Mendip Woodlands SAC

The effects of dust deposition from application 2017/1506/CNT was not considered to be significant. It is reported by Nick Hodgetts that there has been no significant change in bryophytes between the 2008 and 2018 survey (Pers. Com. Henry Andrews MCIEEM, email 9/01/2019). Bryophytes are to be monitored annually in response to any residual effects as part of an updated Biodiversity Management Plan.

Conclusion

An Appropriate Assessment of the proposed project is therefore unnecessary except in response to the potential effects from the culverting of Halecombe Brook affecting the drinking resource of Greater Horseshoe bats and the uncertainty concerning the junction.

²² The applicant proposes that the formal Dust Management Plan (DMP) is maintained. The DMP would be used by operational staff and contractors on a day-to-day basis and would identify the person responsible for compiling the DMP and initiating action following an event which might lead to an increase in dust emissions.

Stage 2: Habitats Regulations Assessment – Appropriate Assessment

Part D: Appropriate Assessment

NB: In undertaking the appropriate assessment, the LPA must ascertain whether the project would adversely affect the integrity of the European site. The Precautionary Principle applies, so to be certain, the authority should be convinced that no reasonable scientific doubt remains as to the absence of such effects.

The Appropriate Assessment considers the impacts on the integrity of the international site, either alone or in combination with other plans and projects, with regard to the site's structure and function and its conservation objectives. Where there are adverse impacts, an assessment of potential mitigation is carried out to determine if there is an overall adverse effect on the integrity of the site. If these mitigation options cannot avoid adverse effects, then development consent can only be given if stages 3 and 4 are followed.

<p>12. Conservation Objectives</p>	<p>Mells Valley SAC</p> <p>The conservation objectives for the Mells Valley SAC with regard to the natural habitats and/or species for which the site has been designated avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features. These include, subject to natural change, to maintain or restore:</p> <ul style="list-style-type: none"> • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site.
<p>13. Effects on those Conservation Objectives of the European Site affected by the proposal</p>	<p>Mells Valley SAC</p> <p><u>The extent and distribution of... habitats of qualifying species</u> There would be the loss of a short length of watercourse used by Greater Horseshoe bat(s) used as a drinking source. In addition, a length of hedgerow would be removed at the entrance to Rookery Farm.</p> <p><u>The structure and function of the habitats of qualifying species</u> The watercourse would be culverted. The loss of hedgerow would remove structure used as fly way by Greater Horseshoe bats.</p> <p><u>The populations of qualifying species</u> The loss of habitat used for drinking and as fly ways is likely to affect less than 1% of the population (see section 14²³) at 4km from the maternity roost and is not considered significant.</p>
<p>14. Information on general trends if available.</p>	<p>Mells Valley SAC</p> <p>Mells Valley in southern England was selected on the basis of the size of its exceptional breeding population. It contains the maternity site associated with a population comprising about 12% of the UK Greater Horseshoe bat <i>Rhinolophus ferrumequinum</i> population. A proportion of the population also hibernates at the site. However, the maternity population is at Wadbury House, outside the designated site. Nonetheless this site is integral to the SAC population and was counted as hosting approximately 300 Greater Horseshoe bats and 100 pups in the summer of 2015. The Old Ironstone Works, which is designated, is likely to be a hibernation roost. (pers. comm. David Cottle, Somerset Bat Group) Many Greater Horseshoe bats disperse to other hibernacula through the Mendips to Cheddar and some as far as Bath, Brockley Hall and perhaps Worcester in Gloucestershire. Balch</p>

	Cave in Fairy Quarry is one of the main sites in the Mendips. (pers. comm. Bob Corns, Natural England).		
15. Assessment on the integrity of the European site's conservation objectives	<p>Greater Horseshoe Bats <u>Loss of drinking habitat</u> There would be a loss of watercourse potentially used for drinking by Greater Horseshoe bats, which would be rendered inaccessible due to culverting. A small number of occasional passes by Greater Horseshoe bats were recorded at his on the western end of the culvert in September four-day recording period only; three on one night and one on the other night. Greater horseshoe bats were not recorded on any other occasion during the periods of automated detector recording. Furthermore, it is likely that only one bat would be affected given the spatial ecology of the species²⁴, i.e. one bat passing back and forth given the lack of connectivity eastward through the quarry due to the existing lighting regime.</p> <p>It is therefore considered unlikely that the loss of the watercourse would have an effect on the integrity of the Greater Horseshoe bat feature of the Mells Valley SAC provided that an alternative water source is secured through condition or otherwise.</p> <p><u>Severance of flight lines</u> There would be a loss of hedgerow structure potentially used by Greater Horseshoe bats commuting in the are of Limekiln Lane. Greater Horseshoe bats will cross gaps in flight lines of up to 12 to 15 meters even when there is a low level of street lighting²⁵. It is considered that any junction arrangement unlikely to exceed this distance.</p> <p>The commuting structure on the south side of Limekiln Lane would remain and at the distance from the maternity roost it is likely that only individual or small numbers of Greater Horseshoe bats would be affected. The Ecological Impact Assessment²⁶ states that '... the effect can be mitigated by infill planting to enhance the flight-line, management to improve the structure, and a bat-crossing point of a maximum 3m width over the access drive.'</p> <p>It is therefore considered unlikely that the loss of the short section of watercourse would have an effect on the integrity of the Greater Horseshoe bat feature of the Mells Valley SAC provided the a horseshoe bat friendly junction design is secured through condition or otherwise.</p>		
16. Assessment of effects taking account of avoidance or reduction measures included in the proposal			
Aspect of project which will be potentially damaging	Avoidance and mitigation measures included in the proposal (and any additional measures required for inclusion in the proposal) At both Construction and Operational Phases	Secured by	Residual effects
Mells Valley SAC Loss of drinking resource for Greater Horseshoe bats	It is proposed to counter-act this loss with the construction of a 20m long, 5m wide, and 1m deep butyl-lined shallow trough that will be demand-fed by a piped pump from a clean water-lagoon in the quarry at one end, and feed slowly over a weir into a soakaway. This will ensure that (unlike the Halecombe Brook) the drinking water is permanent throughout the year, but still remains clean and free of vegetation. The trough will have shallow margins in order that any grounded bat can swim to the side and escape. The northern bank will about a shrub-vegetated screening bund, and the southern bank will be planted with a range of native shrubs in order to provide a sheltered and darkened corridor. However, the ends of the trough will remain	Condition	None predicted

²⁴ Rossiter, S. J., Jones, G., Ransome, R. D. & Barratt, E. M. 2002 Relatedness structure and kin-based foraging in the greater horseshoe bat (*Rhinolophus ferrumequinum*). *Behav. Ecol. Sociobiol.* (2002) 51: 510-518.

²⁵ Billington, G. 2000. *Radio tracking study of Greater Horseshoe bats at Mells, Near Frome, Somerset*. Peterborough: English Nature

²⁶ Andrews et al, 2017. *Ecological Impact Assessment of Land at Halecombe Quarry, Leigh-On-Mendip, Frome, Somerset BA11 3RD*. Bridgwater: Andrews Ecology.

	<p>open in order that bats have an unobstructed flight-path along the full length. In order that the water-source is available to all the bats that currently exploit the Halecombe Brook, the bund will be connected to the farmhouse, and the enhanced linear landscape elements associated with the access road, and thereon to the flight-paths on Limekiln Lane. To ensure success, methods of vegetation and aquatic habitat monitoring, and management will be set out within an overarching Ecological Management Plan. Overall, the surface area of the drinking water resource will remain unchanged. However, as the Halecombe Brook typically runs dry in late summer each year, and the compensatory water-source will be permanent (i.e. year-round) there will be a significant benefit in terms of the duration the source of drinking water is available to all seven bat species concerned. Greater Horseshoe bats tend to forage opportunistically from approximately 4km from a maternity roost.</p>		
<p>Mells Valley SAC</p> <p>Severance of a Greater Horseshoe bat flight line due to unknown junction configuration in Lime Kiln Lane</p>	<p>A design for the junction to Rookery Farm from Limekiln Lane needs to be submitted that demonstrates that commuting bats would not be affected by the creation of the access should be submitted to and approved by the Local Planning Authority prior to any hedgerow removal occurring</p>	Condition	None predicted
<p>17. Does the proposal have potential for in-combination effects with other plans or projects individually or severally</p>	None identified		
Part E: Conclusion			
<p>18. Natural England consultation response</p>			
<p>19. List of mitigation measures and safeguards to be covered by planning obligations (conditions or S106)</p>	<ul style="list-style-type: none"> • A 20m long, 5m wide, and 1m deep butyl-lined shallow trough that will be demand-fed by a piped pump from the Rookery lagoon will be constructed in year 3, to feed slowly over a weir into a soakaway. The trough will have shallow margins in order that any grounded bat can swim to the side and escape. The northern bank will abut a shrub-vegetated screening bund, and the southern bank will be planted with a range of native shrubs in order to provide a sheltered and darkened corridor. However, the ends of the trough will remain open in order that bats have an unobstructed flight-path along the full length. • Details of the junction to Rookery Farm from Limekiln Lane demonstrating that commuting bats would not be affected by the creation of the access shall be submitted to and approved by the Local Planning Authority prior to any hedgerow removal occurring 		
<p>16. Will the proposed development have an adverse effect on integrity?</p>	<p>The Minerals Planning Authority consider that the proposed development is unlikely to have an adverse effect on the integrity of the Mells Valley SAC, provided the mitigation measures are conditioned, and the Mendip Woodlands SAC.</p>		
<p>Author:</p>	Larry Burrows MCIEEM, Ecologist, Somerset County Council.		
<p>Date:</p>	11 th February 2019		

