

Appendix 8.3: Bat Survey

Land at Barkham Square

Land at Barkham
Square: Bat Survey
Draft
November 2025

Approval for issue

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Crest Nicholson Operations Ltd (Chiltern Division)

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Glossary

Term	Meaning
The Applicant	Crest Nicholson Operations Limited (Chiltern m Division)
The Project	Land at Barkham Square

Abbreviations

Abbreviation	Meaning
ES	Environmental Statement
TVERC	Thames Valley Environmental Records Centre.
WCA5	Animal species protected from intentional killing injuring or taking under schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

Units

Unit	Description
km	Kilometres
m	Meters
°C	Degrees Celsius

1 INTRODUCTION

1.1 Overview

- 1.1.1 This Appendix of the Environmental Statement (ES) has been prepared by RPS on behalf of Crest Nicholson Operations Limited (Chiltern Division).
- 1.1.2 The purpose of this technical report is to present the methodology and results of bat surveys for the Project. The results of this report have been used to inform Chapter 8: Ecology and Nature Conservation of the ES.

1.2 Site Description

- 1.2.1 The site is located at Barkham Square, Arborfield south-east of Reading, Berkshire (the Site). It comprises approximately 61.3 ha of mainly grassland grazed by sheep. There are blocks of ancient woodland found on Site. There is a pond located to the south, adjacent to the Barkham Brook. The Barkham Brook runs through the centre of the Site in a north-south orientation.
- 1.2.2 The wider landscape is generally rural in nature with parcels of woodland, including ancient woodland. Arable fields are found to the east and north of the Site. Waterman's Lake is located approximately 30m south of the Site boundary.

1.3 Legislation

- 1.3.1 All British bat species are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981, as updated by the Countryside and Rights of Way Act 2000.
- 1.3.2 All British bats are also included on Schedule 2 of The Conservation of Habitat and Species Regulations 2017 (as amended) as European Protected Species. It is an offence to:
 - Intentionally or recklessly kill, injure or capture bats;
 - Deliberately or recklessly disturb bats (whether in a roost or not); and / or
 - Damage, destroy or obstruct access to bat roosts.
- 1.3.3 A bat roost is defined as 'any structure or place which [a bat] uses for shelter or protection'. As bats tend to reuse the same roosts, legal opinion is that a roost is protected whether or not bats are present at the time of survey.
- 1.3.4 A licence will therefore be required by those who carry out any operation that would otherwise result in offences being committed.

2 METHODOLOGY

2.1 Desk Study

- 2.1.1 A data request was submitted to Thames Valley Environmental Records Centre (TVERC) for records of protected species including Bat Species within 2 km of the Project site as part of the ecology desk study. The full results of the desk study are presented in Appendix 8.1: PEA. The results of the desk study pertaining to bat species are presented in this report.

2.2 Bat Activity Surveys

Nighttime Bat Walkover Surveys

- 2.2.1 A nocturnal transect route incorporating all the habitat types at the site were devised in line with the guidelines at the time (Collins, 2016). The transects were designed to focus on the habitats identified in the PEA as likely to be important for foraging and commuting bats. This included boundary features and other linear habitats which are preferred by bats. The route taken is shown in Annex A.
- 2.2.2 Five bat activity transect surveys were conducted during April, June, August, September and October 2023. Each survey commenced at or before sunset and the surveyor did not start walking around site until at least 30 minutes after sunset. The survey continued for approximately 2-3 hours following sunset.
- 2.2.3 The surveys were undertaken by suitably qualified and experienced ecologists. The survey dates, weather conditions, sunset/sunrise and start/end times are shown in Table 2.1.

Table 2.1: Survey visit dates and weather conditions

Survey Date	Sunset Time	Start Time	End Time	Weather
22/04/2023	20:10	10:07	22:10	Dry, 11°C, wind 3, 100% cloud cover
10/06/2023	21:16	21:00	23:17	Dry, 14°C, wind 2, 0% cloud cover
22/08/2023	20:11	19:44	22:12	Dry, 19°C, wind 2, 80% cloud cover
11/09/2023	19:28	19:10	19:30	Dry, 23°C, wind 2, 40% cloud cover
10/10/2023	18:23	18:12	18:31	Dry, 18°C, wind 3, 10% cloud cover

- 2.2.4 The surveyors were equipped with Bat Loggers for identification of bats in the field and with the capability to record bat calls for later sonogram analysis. All bat passes, including species and time, were recorded. The behaviour of the bat was also recorded if possible, including commuting and feeding behaviour. Bat recordings were later analysed using the computer software Kaleidoscope (Wildlife Acoustics).

Bat Activity Surveys (Static Surveys)

- 2.2.5 Two static detectors were deployed at the site for six months from April to October 2025 the locations of which are shown in Annex B. Statics were deployed for a minimum of 5 nights in good weather conditions.
- 2.2.6 The static detectors used were Elkon Explorer (Bat Logger) and Kaleidoscope (Wildlife Acoustics) software to identify the bat species recorded.

Data Analysis

- 2.2.7 The bat data were recorded, and all bats were identified to species level, where possible using either BatExplorer or Kaleidoscope. Where several bat species were present within a call segment, then all the species were tagged in the results spreadsheet. For example, a common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle, *Pipistrellus pygmaeus* and *Myotis sp.* bats all calling simultaneously would result in three individual bat registrations for calculating bat pass counts.
- 2.2.8 The number of bat passes recorded is not representative of the number of bats present within any given area, as a single bat may have made many passes. Therefore, descriptions of bat species assemblage represent the minimum number present rather than a definite list of all species present.
- 2.2.9 Not all calls could be positively assigned to species. Call frequencies and shapes can be shared by bat species within the same genus and can change according to the habitat they are flying in, i.e.: open areas with no trees or structures such as moorlands; cluttered environments which contain trees, areas of scrub; or linear features such as burns and conifer plantation/woodland edge. Bats adapt their call patterns within their habitats to enable prey detection and navigation and as such, the recordings may differ in parameters. For example, both Leisler's bat and noctules can echolocate at the same frequency and with the same call shape and therefore, where not possible to distinguish species, they have been assigned to the *Nyctalus spp.* category and not identified to species level. Similarly, a bat was classified as *Myotis spp.* if differences in call shape and frequency between Daubenton's bats and Natterer's bats (most likely *Myotis spp.* bat to be found in the area) could not be discerned.

2.3 Preliminary Bat Roost Assessment

- 2.3.1 An internal and external inspection of the building within the Project site boundary was undertaken on 18/08/23.
- 2.3.2 The survey used close focusing binoculars and a high-powered torch as necessary. The visit was completed in accordance with Bat Surveys for Professional Ecologists: Good Practice Guidelines (BCT, 2023).
- 2.3.3 The structure was assessed to determine the actual or potential presence of bats and the need for further survey and/or mitigation.
- 2.3.4 To assess the potential bat roosting suitability, roosting features and evidence of bats were searched for, such as:
- Live, dead or skeletons of bats;
 - Bat droppings in roof voids (particularly below ridge beam and apex);
 - Feeding remains e.g., insect wings;
 - Tiny scratches / claw marks around external entry points;
 - Urine staining or polishing around external entry point;
 - Bat droppings in, around or below entry points of the buildings;
 - Audible squeaking at dusk or in warm weather;
 - Flies around entry point; and
 - Smoothing of surfaces around a cavity.
- 2.3.5 Structural features that may influence the suitability of a building to support roosting bats include the presence of a roof void, the presence of access points into the building

(including gaps beneath barge boards, soffits and fascia boards, gaps under lead flashing, gaps within masonry and under loose tiles, gaps between mortise and tenon joints), the complexity and size of any roof voids and daytime light levels in the roof voids.

- 2.3.6 In addition to the building assessment, the surveyor identified surrounding habitat that had any potential to support roosting, commuting and foraging bats. The surrounding habitat can influence roost potential and notes were made on the setting of the structures, their proximity to significant linear habitat features (such as a watercourse, mature hedgerow, wooded lane or an area of woodland) and other factors including artificial lighting.
- 2.3.7 Taking account of the architectural and habitat features, the buildings were assigned a level of roost suitability (Table 2:1 below) based the criteria given in the Bat Surveys for Professional Ecologists: Good Practice Guidelines (BCT, 2023) and professional judgement. The primary objective of this exercise was to identify the need for further detailed bat survey, or alternatively to obtain sufficient information that would dismiss the need for further assessment.

Table 2.2: Categories for Bat Roosting Potential of Structures

Category	Criteria
Negligible Potential	No obvious habitat features on site likely to be used by roosting bats; however a, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.
Low Potential	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year but not on a regular basis or by a large number of bats.
Moderate Potential	A structure with one or more potential roost sites that could be used by bat but unlikely to support a roost of high conservation status. Continuous habitat connected to the wider landscape that could be used by bats.
High Potential	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time. Potential to support high conservation status roosts. Continuous, high-quality habitat that is well connected to the wider landscape and is likely to be used regularly by bats. Site may be close to and connected to known roosts.

2.4 Emergence Surveys

- 2.4.1 Bat Emergence surveys were undertaken in accordance with best practice guidelines and recommendations published by the Bat Conservation Trust in Bat Surveys for Professional Ecologists: Good Practice Guidelines (BCT, 2023)
- 2.4.2 During the Preliminary Bat Roost Assessment, a small shed in the North of the site was identified as having high roost suitability and therefore following best practice guidelines required three separate dusk emergence visits. These were conducted on the 5th August 2024, 2nd September 2024, and the 30th September 2024.
- 2.4.3 Dusk emergence surveys commenced 15 minutes before sunset and continued for approximately 1.5 hours after sunset.
- 2.4.4 Surveys were completed under appropriate conditions i.e. absent of heavy rain, strong wind or if the air temperature dropped below 10°C.
- 2.4.5 During each survey the building was surveyed by two experienced ecologists from different viewing points, as shown in Annex B. Viewing observations were made of where bats emerged from and in what direction they were flying to/ from. Behavioural observations were also recorded for any bats encountered on site or within the vicinity, including direction of flight and activity observed e.g. foraging and commuting.

- 2.4.6 Elekon Batlogger and Anabat bat detectors were used to detect echolocation calls from any bats emerging. Recordings were made of any bat calls heard and these were analysed using BatExplorer and Kaleidoscope software to identify the species present. Camera data was analysed by experienced ecologists using Windows Media Player.
- 2.4.7 The dates, times and weather conditions for the emergence surveys are provided in Table 2.1 below.

Table 2.3: Survey visit dates and weather conditions

Survey Date	Sunset Time	Start Time	End Time	Weather
05/08/2024	20:43	20:28	22:13	Dry, 18°C, wind 2, 100% cloud cover
02/09/2024	19:42	19:41	21:17	Dry, 21°C, wind 1, 100% cloud cover
30/09/2024	18:42	18:34	20:12	Dry, 15°C, wind 4, 100% cloud cover

2.5 Limitations

Bat Surveys

- 2.5.1 It should be noted that bats are a group of species with a range of dynamic behaviours and as such, bats can roost in different locations, forage in different areas and preferentially commute along different routes in response to a number of changing physical and environmental factors. Bats exhibit seasonal use of buildings, built structures and trees, and being so mobile may arrive and start using a site after it has been surveyed or be roosting somewhere else during the period it was surveyed. Therefore, this survey provides a snapshot of ecological constraints found to be present at the time and should not be relied upon as evidence of presence / absence for periods longer than one year from the most recent bat survey.
- 2.5.2 The bat data presented in the tables detailing results of the bat surveys shows the number of contacts for different bat species. It is important to note that the number of contacts does not equate to number of individual bats, as several contacts can be generated by one bat flying past the surveyors several times. Instead, the number of contacts provides an index of bat activity, which can be used to identify areas of habitat of greater or lesser importance for bats.
- 2.5.3 Species identification by sonogram is limited to a certain extent by similarities in call structure parameters for certain species. All bats modulate their calls according to the habitats they are navigating and their behaviour. This imposes limitations on reliable identification of bats to species level for species of the same genus, and specifically for *Plecotus* sp., *Myotis* sp. and *Nyctalus* sp. bats.
- 2.5.4 Long-eared bats and some bats within the genus *Myotis* echolocate quietly and are therefore less likely to be picked up by the bat detectors and recording equipment. These species are often under-recorded on surveys.
- 2.5.5 It should be noted that some statics after deployment experienced a technical failure and therefore this limits the accuracy of any population estimates made.
- 2.5.6 Whilst every effort is taken to ensure the devices are recording when deployed, technological failures cannot be avoided all together. Where recordings failed and there was enough time, statics were re-deployed to cover the missed survey period.
- 2.5.7 Additionally, due to access difficulties, for survey 2 and 3 the surveys commenced later than 15 minutes before sunset. This could potentially affect what bat behaviour was observed during the survey. However, the difference in start time was relatively minor.
- 2.5.8 Although the middle emergence survey was undertaken at the very start of September, on 02/09/24, rather than before the end of August, the two day difference is not

considered to have changed the outcome of the survey, in the context of a very small building with easy access to the whole structure, the result of no bat roost likely present is considered valid.

Preliminary Bat Roost Assessment

- 2.5.9 It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no investigation can ensure the complete characterisation and prediction of the natural environment.
- 2.5.10 The protected/notable species assessment provides a preliminary view of the likelihood of these species occurring on the site, based on the suitability of the habitat, known distribution of the species in the local area provided in response to our enquiries and any direct evidence on the site. It should not be taken as providing a full and definitive survey of any protected/notable species group

Accurate Lifespan of Ecological Data

- 2.5.11 The majority of ecological data remain valid for only short periods due to the inherently transient nature of the subject. The survey results contained in this report are considered accurate for two years, assuming no significant considerable changes to the site conditions.

3 RESULTS

3.1 Desk Study

- 3.1.1 The desk study identified a total of 463 records of bat species within the study area, dating from 1994 to 2020. The closes records being multiple unidentified *Pipistrelles sp.* and common pipistrelle *Pipistrellus pipistrellus* These records are from within the same 1km grid-square as the Project site.

3.2 Bat Activity Surveys

Static Detectors

- 3.2.1 Table 3.2 shows the number of bat echolocation contacts for each species recorded each survey at each static location.
- 3.2.2 Static detector locations can be seen in Annex B and corresponding figure references numbers/letters in Table 3.2.

Table 3.1: Number of Bat Contacts Recorded During Static Monitoring Surveys.

Month	Survey Dates	Recorder	Number of Nights Recording	Figure Reference	COP	SOP	NOC	NLE	MYO	BLE	BAR	Total
April	23/04/2024 – 28/04/2024	Static 1	5	1	1548	163	3		6			1720
		Static 2	5	2	34	16						50
May	13/05/2024 – 18/05/2024	Static 1	5	1	391	120	323	11	16	6	1	868
		Static 2	5	2	757	1472	183	6	7	1		2426
June	10/05/2024 – 15/06/2024	Static 1	5	1	726	711	469	4				1910
		Static 2	5	2	412	172	1		2			587
July	24/07/2024 – 29/07/2024	Static 1	5	1	2023	319	279	26	15	29	2	2693
		Static 2	RF	2								
August	15/08/2024 – 20/08/2024	Static 1	5	1	701	2237	1140	74	20	37	1	4210
		Static 2	5	2	950	51	97	8	1	4	1	1112
September	11/09/2024 – 16/09/2024	Static 1	5	1	1336	3195	179	8	11	2		4731
		Static 2	5	2	2675	3058	23	16	5	2	3	5782
October	10/10/2024 – 15/10/2024	Static 1	5	1	116	83	1			1		201
		Static 2	5	2	141	34	3	1	1	1	1	182

RF = Recorder failure COP = Common Pipistrelle, SOP = Soprano Pipistrelle, NOC = Noctule, NLE = Leisler's bat, MYO = Myotis sp., BLE = Brown Long-eared Bat, BAR = Barbastelle.

Nighttime Bat Walkover

- 3.2.3 The NBW activity surveys were undertaken in April, June, August, September and October 2023, the results of the surveys are presented below.

April 2023

- 3.2.4 Figure 1 within Annex A shows the results of the April 2023 transect.
- 3.2.5 The first recorded call was a soprano pipistrelle at 21:07, 55 minutes after sunset exhibiting foraging behaviour above the pond within the south-west of the site. The majority of the recordings throughout the survey were soprano pipistrelle. Common pipistrelle was also recorded; the first recording was taken at 21:06 within an area of woodland and adjacent to the pond within the south-west of the site.
- 3.2.6 The majority of recordings were adjacent to the pond and woodland within the south-east of the site.

June 2023

- 3.2.7 Figure 2 within Annex A shows the results of the June 2023 transect.
- 3.2.8 The first recorded call was a noctule at 21:30, 14 minutes after sunset exhibiting foraging behaviour within an area of woodland in the south-east of the site. Soprano pipistrelle was the next recorded species; the first recording was taken at 21:32 within an area of woodland and adjacent to the pond within the south-west of the site.
- 3.2.9 Common pipistrelle was the most recorded species throughout the survey, and the first recording was taken 21:39 adjacent to the northern boundary.
- 3.2.10 *Myotis* sp. was also recorded at 22:20 adjacent to the south-eastern pond.

August 2023

- 3.2.11 Figure 3 within Annex A shows the results of the 22nd August 2023 transect.
- 3.2.12 The first recorded call was a soprano pipistrelle at 20:39, 28 minutes after sunset along the northern boundary. Common pipistrelle was also recorded; the first recording was taken at 20:44. The majority of the recordings across the site were common pipistrelle.
- 3.2.13 Noctule was also recorded during the survey at 21:03 along the tree line of the eastern boundary.
- 3.2.14 A *Myotis* sp. was also recorded at 21:20.
- 3.2.15 Bats were observed foraging and commuting throughout the survey. The majority of the activity was along the eastern boundary.

September 2023

- 3.2.16 Figure 4 within Annex A shows the results of the 11th September 2023 transect.
- 3.2.17 The first recorded call was noctule at 19:28, 0 minutes after sunset within an area of woodland to the south-east of the Project site. The majority of the recordings across the site were common and soprano pipistrelle. The majority of the calls were within the woodland and along the western boundary.

October 2023

- 3.2.18 Figure 5 within Annex A shows the results of the 10th October 2023 transect.
- 3.2.19 The first recorded call was a common pipistrelle at 18:49, 26 minutes after sunset along the northern boundary. Soprano pipistrelle was also recorded; the first recording was taken at 18:53. The only recorded species during the survey across the site were common and soprano pipistrelle.

Summary

- 3.2.20 The site was assessed as being of high suitability for foraging and commuting bats in line with Collins, 2023.
- 3.2.21 At least seven bat species were identified as a result of static detector and nighttime bat walkover surveys, including:
- Common pipistrelle;
 - Soprano pipistrelle;
 - Noctule;
 - Leisler's bat;
 - Myotis sp.;
 - Brown long-eared bat;
 - Barbastelle.
- 3.2.22 Soprano pipistrelle were the most frequently recorded species. They were recorded during every survey session. Common pipistrelle was the next most frequent species also recorded during every session. Noctule was the third most recorded species. These species were the only other species to be recorded in high numbers across the site, indicating the site is of foraging importance and/or roosts of these species are nearby to the site.
- 3.2.23 Myotis sp. were recorded during the static detector surveys. It is very difficult to reliably separate Myotis sp. bats using ultrasonic calls. Therefore, additional species of Myotis may be present, and thus potentially more than seven species of bat may use the site for foraging/commuting.
- 3.2.24 Other species were recorded in comparatively much lower numbers and were not recorded during every survey.
- 3.2.25 On average bat activity recorded was highest within the woodland and adjacent to the site boundaries.

3.3 Preliminary Bat Roost Assessment

- 3.3.1 One building was located within the Project boundary.
- 3.3.2 B1 is a wooden shed located within the north of the site, adjacent to the site boundary. It was deemed to have high potential to support roosting bats due to the presence of several missing tiles within the roof and gaps between the wooden slats that make up the sides of the building.
- 3.3.3 Three emergence surveys were undertaken on the building between August and September 2024 and results are provided in section 3.5 below.

3.4 Emergence Surveys

3.4.1 Results from the bat emergence surveys undertaken for B1 are detailed below in Table 3.1.

Table 3.2: Emergence Surveys Results

Visit Number	Survey Date	Emergences recorded	Notes	Roost Type
1	05/08/2024	None	None	None
2	02/09/2024	None	None	None
3	30/09/2024	None	None	None

4 SUMMARY

- 4.1.1 The desk study identified 463 records of bat species within 2 km of the Project site.
- 4.1.2 Two bat static detectors were deployed between April to October 2023 and identified several species of bat within the Project site boundary, providing evidence for the Project site to support a number of foraging and commuting bats.
- 4.1.3 The rare Annex II species Barbastelle was recorded occasionally using the site. In order to investigate this further, the times of the calls were assessed. These were generally in the early hours of the morning, suggesting this species occasionally passed through the site to other feeding grounds and was not roosting nearby.
- 4.1.4 Nighttime bat walkover surveys also conducted within the same year, hold a similar result, with many of the observations observed within the woodland and adjacent to watercourses present within the site boundary.
- 4.1.5 During the PBRA, a single building (B1) was identified as having a high potential for supporting roosting bats and was surveyed three times between August and September 2024.
- 4.1.6 No bat emergences were observed on any of the three survey visits and therefore no roosts were identified within the structure.

5 REFERENCES

Collins J. (ed.) (2016). *Bat surveys for Professional Ecologists: Good practice guidelines* (3rd Edition). The Bat Conservation Trust, London.

Bat Conservation Trust and Institution of Lighting Professionals (2018). *Guidance Note 8: Bats and artificial lighting*. Institution of Lighting Professionals, Rugby.

Annex A Transect Route and Results

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LEGEND

-  Site Boundary
-  Bat transect route

Species

-  Common pipistrelle
-  Soprano pipistrelle



Client	Crest Nicholson Operations Ltd		
Project	Land at Barkham Square		
Project No.	794-ENV-ECO-03176		
Title	Bat Transect Survey Results: April 2024		
Drawing No. ECO03176-0009-01 BatTransect	Figure No. B.1	Revision 01	Status FINAL
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LEGEND

- Site Boundary
- Bat transect route

Species

- Common pipistrelle
- Soprano pipistrelle
- Noctule
- Myotis species



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Project No.	794-ENV-ECO-03176		
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LEGEND

- Site Boundary
- Bat transect route

Species

- Common pipistrelle
- Soprano pipistrelle
- Noctule



Client **Crest Nicholson Operations Ltd**

Project **Land at Barkham Square**

Project No. **794-ENV-ECO-03176**

Title **Bat Transect Survey Results:
August 2024**

Drawing No. ECO03176-0009-01 BatTransect	Figure No. B.3	Revision 01	Status FINAL
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Date NOV 2025	Drawn By LP	Checked By NB	Revision By LP
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Scale @ A3 1:4,000	Datum OSGB 1936
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LEGEND

Site Boundary

→ Bat transect route

Species

- Common pipistrelle
- Soprano pipistrelle
- Noctule



Client	Crest Nicholson Operations Ltd		
Project	Land at Barkham Square		
Project No.	794-ENV-ECO-03176		
Title	Bat Transect Survey Results: September 2024		
Drawing No. ECO03176-0009-01 BatTransect	Figure No. B.4	Revision 01	Status FINAL
Date NOV 2025	Drawn By LP	Checked By NB	Revision By LP
Scale @ A3 1:4,000		Datum OSGB 1936	

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LEGEND

- Site Boundary
- Bat transect route

Species

- Common pipistrelle
- Soprano pipistrelle



Client **Crest Nicholson Operations Ltd**

Project **Land at Barkham Square**

Project No. **794-ENV-ECO-03176**

Title **Bat Transect Survey Results:
October 2024**

Drawing No. ECO03176-0009-01 BatTransect	Figure No. B.5	Revision 01	Status FINAL
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Date NOV 2025	Drawn By LP	Checked By NB	Revision By LP
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Scale @ A3 1:4,000	Datum OSGB 1936
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Annex B Static Bat Detector Locations



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LEGEND

- Site Boundary
- Location of bat static detector



Client **Crest Nicholson Operations Ltd**

Project **Land at Barkham Square**

Project No. **794-ENV-ECO-03176**

Title **Location of Bat Static Detectors**

Drawing No. ECO03176-0008-01 Statics	Figure No. A.1	Revision 01	Status FINAL
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Date NOV 2025	Drawn By LP	Checked By NB	Revision By LP
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Scale @ A3 1:5,000	Datum OSGB 1936
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