BAT ACTIVITY SURVEY

RELATING TO LAND AT THE PROPOSED WESTERN EXTENSION AT

DENBIGH QUARRY, DENBIGHSHIRE

APPLICATION FOR PLANNING PERMISSION

For Breedon Southern Limited

December 2019

PSL Report Reference Number: M18.155.R.011

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Report Prepared for
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BAT ACTIVITY SURVEY ON LAND AT DENBIGH QUARRY, PLAS CHAMBRES ROAD, DENBIGH, DENBIGHSHIRE, LL16 5US

By:
Pleydell Smithyman Limited

December 2019

Bat Activity Survey

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1.0 INTRODUCTION

Background and Proposals

1.1 Pleydell Smithyman Limited was instructed by Breedon Southern Limited to undertake bat activity surveys on land at the proposed western extension of Denbigh Quarry, Denbighshire. The existing quarry and the proposed western extension combined are hereafter referred to as 'the site'. Please see Drawing Number M18.155.D.014: Preliminary Ecological Appraisal, for a plan showing the existing quarry boundary and the proposed western extension boundary.

1.2 The surveys were required following a Preliminary Ecological Appraisal that identified suitable foraging and commuting habitat for bats. The surveys were used to both inform the preparation and submission of the planning application for the extraction of mineral from the proposed western extension of the existing quarry and also to ensure compliance with national and European legislation. The surveys covered the whole site (as shown on Drawing M18.155.D.014), however the assessment was focussed on any areas of change (i.e. the proposed western extension) as the existing quarry will continue to work in the same manner.

Site Location

1.3 The site is located off Fford Y Graig Road, approximately 950m to the north of the centre of Denbigh in Denbighshire. The site is centred on grid reference SJ050671.

Site Description

1.4 The site comprises an existing working quarry with bare earth, open water and cliff faces. The working quarry is surrounded by areas of plantation and semi-natural woodland with small areas of scattered scrub. The north-western boundary of the extension is bordered by Crest Mawr Wood Site of Special Scientific Interest (SSSI).

1.5 In the wider area, arable and pastoral land with hedgerows dominates the majority of the northern and western landscape, with the town of Denbigh present to the south and east. An industrial park is also present to the east. Additional areas of woodland are present further to the east and south which are likely to offer additional foraging and commuting habitat for bats.

Legislation

1.6 All British bats are European protected species and therefore receive protection under the Conservation of Habitats and Species Regulations 2017 (as amended), making it an offence to:

- Deliberately kill, injure or capture a bat;
- Deliberately disturb bats, including in particular any disturbance which is likely to:
    - Impair their ability to survive, reproduce or to rear or nurture their young;
    - Impair their ability to hibernate or migrate; or
    - Significantly affect their local distribution or abundance.
- Damage or destroy a breeding site or resting place of a bat;
- Possess or control any live or dead specimen or anything derived from a bat;
- Sell, offer for sale, possess or transport a bat (live or dead, part or derivative) for the purpose of sale or advertise for buying or selling.

1.7 In addition, all British bats are listed under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), which contains further provisions making it an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure or place which any bat uses for shelter or protection; or
- Disturb any bat while occupying a structure or place which it uses for that purpose.

1.8 European Protected Species Licences (EPSLs) can be obtained from the relevant Statutory Nature Conservation Organisation (SNCO), in this case Natural Resources Wales, for development activities that would otherwise be unlawful under the legislation.

1.9 Common pipistrelle (*Pipsitrellus pipistrellus*), soprano pipistrelle (*Plpistrellus pygmaeus*), noctule (*Nyctalus noctula*), brown long-eared (*Plecotus auritus*), barbastelle (*Barbastella barbastellus*), Bechstein's (*Myotis bechsteinii*), greater horseshoe (*Rhinolophus ferrumequinum*) and lesser horseshoe (*Rhinolophus hipposideros*) bats are also listed on

the Natural Environment and Rural Communities Act 2006 Section 42 list of species of principal importance for conservation of biological diversity in Wales.

Aims and Objectives of the Study

1.10 The key objective of the bat activity surveys was to determine the abundance, composition and spatial distribution of bats on the site. This information would help enable an assessment of the importance of the site for bats and the effects of the proposals on bat populations to be made. It will also help determine the need for and scope of any mitigation measures.

1.11 The aims and objectives of the surveys were therefore to:

- Make an assessment of the approximate abundance of bats on the site;
- Determine which species are present;
- Determine how bats are using the site (foraging, commuting etc);
- Make an assessment as to the spatial distribution of bats within the site;
- Provide sufficient data to enable a robust assessment of the effects of the proposed development on local bat populations to be made;
- Provide recommendations for any necessary mitigation measures; and
- Provide recommendations for enhancement measures above and beyond the need to mitigate adverse effects.

2.0 SURVEY METHODOLOGY

Desk Study

2.1 In order to compile background information on the site and its immediate surroundings, information on statutory designated sites within 2km of the site was obtained from the Multi-Agency Geographic Information for the Countryside (MAGIC) website.

2.2 Cofnod (North Wales Environmental Information Service) was also commissioned to undertake a data search for all protected and notable species, habitats and all sites of conservation importance within a 2km radius of SJ049671 (the central grid reference for the site). Relevant information is reproduced in Appendix 1.

2.3 Reference was also made to Ordnance Survey maps and aerial photography, which were used to provide information on land use and habitat connectivity throughout the area.

Habitat Assessment

2.4 The initial habitat assessment was undertaken as part of the Preliminary Ecological Appraisal of the site completed in April 2019 by Kelly Hopkins BSc (Hons) ACIEEM of Pleydell Smithyman Limited.

2.5 This was completed in line with Collins (2016) and included an assessment of the extent, quality and diversity of habitats present and their potential importance in providing linkages within the landscape for bats.

Bat Activity Survey

Transect

2.6 The methodology for the bat activity survey followed that described in the Bat Surveys for Professional Ecologists Good Practice Guidelines, 3rd Edition, (Collins, 2016), for transect surveys.

2.7 This methodology involves identifying a suitable transect route which covers the habitats and features that have been identified from the assessment as potentially providing suitable foraging and commuting habitat for bats.

2.8 The site as a whole, in line with Collins 2016, was considered to be of moderate habitat quality due to the connections of the hedgerows and woodland into the wider landscape. However, in this case, as the majority of the features that provide connectivity to the wider area will be retained and unaffected, the site is assessed to offer low habitat quality due to the largely unsuitable habitat (comprising quarry and improved grassland), with additional suitable areas of foraging habitat located in the wider area.

2.9 The guidelines state that for sites with low suitability habitat for bats one survey visit per season (spring, summer and autumn) in suitable weather conditions should be conducted.

2.10 For this site, one transect was undertaken on each of the surveys. Please refer to Drawing M18.155.D.021 for a plan showing the transect route. The transect route was kept the same for each survey, with the direction and stopping points varied each survey.

2.11 The surveys undertaken were carried out by surveyors walking at a constant speed, recording bat activity for subsequent analysis. Regular listening stops were incorporated into the transect at comparable distances with bat activity recorded at each point for 3 minutes, as well as in-between the points.

2.12 The surveyors used a combination of EM3+, Bat Box Duet and Echo Meter Touch 2 Pro detectors over the course of the surveys, with sound recordings made using the EM3+ and the Echo Meter Touch 2 Pro detectors.

2.13 The surveys included one dawn survey and two dusk surveys. Dusk surveys commenced at sunset and continued for approximately 2 hours after sunset. Pre-dawn surveys commenced approximately 2 hours before sunrise and finished at sunrise. Bat activity across the site was considered to be thoroughly covered within this timeframe. The below table shows the weather conditions during the surveys undertaken.

Table 1: Survey dates and prevailing weather conditions

Date	Weather Conditions
21/5/2019 (Dawn)	Dry, still (Beaufort Scale 0), 25% cloud cover, air temperature 8˚C
13/8/2019 (Dusk)	Scattered showers, light breeze (Beaufort Scale 2), 90% cloud cover, air temperature 18.6 – 16.9°C
24/9/2019 (Dusk)	Dry, light breeze (Beaufort Scale 2), 75% cloud cover, air temperature 17-16˚C

2.14 The bat activity surveys were orchestrated and undertaken by Kelly Hopkins (Natural Resources Wales bat licence number: S086565/1) with assistance from Rosie Marston and George Hicks.

2.15 Please see Drawings M18.155.D.021, M18.155.D.022 and M18.155.D.023 for maps of the bat activity on each survey.

Static Detectors

2.16 The guidelines also state that automated/static bat detector surveys should be conducted at one location per transect, with data to be collected on five consecutive nights per season (spring, summer and autumn) in suitable weather conditions.

2.17 The static bat detectors used were Anabat Expresses. One detector was placed in the same location during each season. The detector was left on site for a period of at least five days during suitable weather conditions. The static detectors were set up so that they recorded in night mode, picking up activity from dusk to dawn.

2.18 The static bat detectors were put out on site over the following timeframes: 21st May – 4th June 2019; 11th June - 19th June 2019 and 24th September – 29th September 2019. The detectors were left on site for longer than the required 5 days during Spring and Sumemr. This allowed for any poor weather conditions that may be observed during the week. All recorded data was analysed. For the location of the static bat detector please see Drawing M18.155.D.021.

Analysis of Recordings

2.19 It should be noted that recordings were analysed using Analook software following the surveys, however calls of species belonging to the genus Myotis are very difficult to determine to species level due to the high level of variability. Where calls of species

belonging to the genus Myotis have been recorded, these have not been identified to species level, although possible species have been stated where call characteristics are typical of that species in question.

2.20 The data analysis with Analook involved reviewing the species recorded, and categorising the passes into rare (one pass), occasional (two-three passes), frequent (four-six passes) and constant (constant activity). The number of minutes that activity was recorded by each species at each activity level was determined.

Survey Constraints and Limitations

2.21 During the first activity survey, the temperature was 8°C, which is considered colder than the recommended survey temperature ranges. However, the sunset temperature was above 10°C and bat activity was recorded during the survey therefore the survey is considered to be valid.

2.22 During the second activity survey, occasional light and heavy rain showers occurred throughout. During this period, bats were still active and therefore the weather conditions are not considered to have significantly affected the results of the survey.

2.23 This report is considered to represent an accurate assessment of the findings at the time of the surveys and is fully appropriate to begin to inform a robust assessment of the effects of the proposals to be made. The survey data are considered to be robust in informing the design of mitigation (where required) and enhancement measures in relation to the proposed works.

2.24 This report should be read in conjunction with the bat roost report (Pleydell Smithyman Limited, 2019), which together provide a robust assessment of bat activity across the site.

3.0 RESULTS

Desk Study

Species Records

3.1 Cofnod returned records of unknown bat species (*Chiroptera*), Pipistrelle bat species (*Pipistrellus* sp.), Myotis bat (*Myotis sp.*) and brown long-eared bat within 2km of the central point of the site. None of these records were specific to the site, with the closest being a brown long-eared bat from approximately 450m to the south. This record was from 1986. All other records were dated between 1988 and 2005. No contemporary records were provided.

Bat Activity Surveys

3.2 For the full results of the surveys, please refer to Appendix 2.

3.3 The first bat activity survey recorded foraging activity from common pipistrelle bats only. Commuting activity was recorded by common pipistrelle, noctule and lesser horseshoe bats. All activity was considered either rare (one pass) or occasional (two – three passes). Bat activity was recorded along the northern and southern boundaries of the site and within the woodland to the east and north-west of the site. The last call was at 04.38 which was 30 minutes before sunrise suggesting that common pipistrelle could be returning to a nearby roost.

3.4 The second bat activity survey recorded foraging activity from common and soprano pipistrelle, Leisler's (*Nyctalus leisleri*) and serotine (*Eptesicus serotinus*) bats. Commuting activity was recorded from soprano pipistrelle, noctule and lesser horseshoe bat. Social calls were also recorded from soprano pipistrelle. The activity was recorded along the northern and southern boundaries of the site, with activity also recorded along the eastern boundary of the proposed extension; and within the woodland to the east and south-west of the site. Regular activity was also recorded along the road bordering the entrance to the quarry and around the trees present within the proposed extension. The first call was at 21.17 which was 31 minutes after sunset making it possible that this common pipistrelle had emerged from a nearby roost.

3.5 The third bat activity survey recorded foraging common and soprano pipistrelle, noctule, Leisler's, serotine and a bat belonging to the genus Myotis. The calls of this Myotis bat had the characteristics of a Natterer's bat (*Myotis nattereri*). Commuting

activity was recorded by noctule, pipistrelle sp., common and soprano pipistrelle. Social calls were also recorded from soprano pipistrelle and brown long-eared bats. The activity recorded during this survey was along the majority of the transect route, with the exception of the woodland to the east of the site. Particular hotspots of activity were recorded around the boundaries of the proposed extension; along the south-western boundary of the site and along the road adjacent to the entrance to the site in the south-east. The first call was recorded at 19.31 which was 23 minutes after sunset making it possible that this soprano pipistrelle had emerged from a nearby roost. These bats often emerge around 20 minutes after sunset.

3.6 For the locations of the bat activity recorded during the surveys please see Drawings M18.155.D.021, M18.155.D.022 and M18.155.D.023. Please see Appendix 3 for example bat calls.

3.7 During the bat activity surveys completed on the site, eight species (common pipistrelle, soprano pipistrelle, noctule, Leisler's, serotine, brown long-eared, lesser horseshoe and a Myotis sp. bat were recorded.

Static Detector Surveys

3.8 For the full results of the static detector surveys, please refer to Appendix 2. For the locations of the static detectors during 2019, please see Drawing M18.155.D.021.

3.9 The spring static detector recorded common pipistrelle and noctule. The majority of the activity was from common pipistrelle (a total of 46 passes (88% of the total passes)), with 6 passes (12% of the total passes) from noctule.

3.10 The summer static detector recorded common pipistrelle and noctule. Only four bat passes were recorded, with two passes from each species.

3.11 The autumn static detector had a total of 784 files, however this was all disturbance noise and no bat calls were recorded.

3.12 A total of two species of bat were recorded via the static detectors (common pipistrelle and noctule). The static detector was placed in the same location during each season, with the same settings and fully charged batteries and an empty and compatible SD card. It is unusual that such limited activity was recorded during the summer season and that no bat activity was recorded during the autumn season, however this is not considered to be due to a technical problem.

3.13 The spring detector recorded activity from a common pipistrelle between 35 and 42 minutes before sunrise on four mornings and recorded activity between 26 and 40 minutes after sunset on three evenings. It is therefore possible that a common pipistrelle roost is in relatively close proximity to the location of the static detector. Common pipistrelle bats are known to emerge from their roosts usually around 20 minutes after sunset with a varied dawn re-entry time between 30 minutes before sunrise to 30 minutes after sunrise (Jersey Bat Group, 2019). The earliest noctule bat recorded after sunset during the spring detector recordings was 35 minutes after sunset, with other activity recorded between 85 and 87 minutes after sunset. Typically, noctule bats emerge around 5 minutes after sunset making it unlikely that a noctule bat roost was present in close proximity to the location of the static detector.

3.14 The summer detector recorded the earliest common pipistrelle activity 60 minutes after sunset and no activity before sunrise making it unlikely that a roost for common pipistrelle was present in close proximity to the location of the static detector at this time. The earliest noctule bat recorded was 44 minutes after sunset which makes it unlikely that a noctule bat roost was present in close proximity to the location of the static detector.

3.15 The only species recorded in the location of the proposed extension throughout the surveys were common pipistrelle, soprano pipistrelle and noctule bats.

Assessment

3.16 An assessment of the foraging and commuting importance has been completed following the guidelines in Wray (2010). This has been calculated for commuting routes by only individual bats of common (common pipistrelle and soprano pipistrelle), rarer (lesser horseshoe) or rarest (noctule) categorised species being recorded with an unknown number of roosts or potential roosts nearby and the complexity of the linear features being classed as walls, gappy or flailed hedgerows, isolated well-grown hedgerows and moderate field sizes. The site is considered to be of regional value due to the score of 32. This is due to noctule bats being classified as in the rarest category for Wales. It is, however, considered that this category is inaccurate, as noctule bat records are present across the majority of Wales and this bat is considered much more likely to be considered to be within the 'rarer' category for Wales. The assessment, has therefore been altered to only include commuting bats

within the common or rarer categories, and therefore the value for commuting bats would be of local, district or parish value due to the score being 17.

3.17 For foraging areas, the value has been calculated from the presence of individual bats of common (common and soprano pipistrelle bats), rarer (Natterer's and brown long-eared bats) and rarest (noctule and serotine) categorised species being recorded with an unknown number of roosts or potential roosts nearby and the foraging habitat characteristics categorised as isolated woodland patches, less intensive arable and/or small towns and villages. Small numbers of soprano pipistrelle bats were recorded, however as this species is classified as common the total score for small numbers of a common bat species is lower than for individual bats of rarest bat species. Leisler's bat is not categorised within Wales in the guidance by Wray and therefore it is considered that this species could be put into the rarest category due to the limited number of records across the country.

3.18 Taking the highest score (32) the value of the whole site for foraging bats is therefore considered to be of regional importance.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Eight species of bat (common pipistrelle, soprano pipistrelle, noctule, Leisler's, serotine, brown long-eared, lesser horseshoe and bat belonging to the genus Myotis) were confirmed as foraging and/or commuting on or very close to the site during the course of the surveys. Of the recorded bat species, common pipistrelle was the most frequently encountered.

4.2 Single bats were encountered the majority of the time and the overall levels of activity of these bats was most often considered occasional (2-3 passes).

4.3 A static detector was placed on the site during each season, with regular activity recorded during the spring season only. Common pipistrelle and noctule bats were recorded on the static detector.

4.4 Recorded bat activity, particularly for common pipistrelle bat was from close to sunset and sunrise making it possible that a bat roost for common pipistrelle was present in close proximity to the static detector location.

4.5 Hotspots of bat activity occurred around the eastern boundary of the proposed extension and towards the northern, south-western and south-eastern boundaries of the site. Frequent activity was recorded along the road adjacent to the entrance to the quarry.

4.6 With regards to assessing the potential impacts of the proposals on bats, the proposals will involve the removal of improved grassland, quarry, scattered scrub, scattered trees, a defunct hedgerow, and a section of broad-leaved plantation woodland from the proposed western extension. The external boundaries of the site will not be directly affected by the proposed extension and all broad-leaved semi-natural woodland will be retained and unaffected by the proposals.

4.7 As a result, the proposals would involve the removal of some features that are used by foraging and commuting bats, including a defunct hedgerow, scattered trees and an area of broad-leaved plantation woodland. The loss of this habitat is likely to have a negative impact upon local bat populations as this habitat provides suitable foraging and commuting habitat. The value of the site for foraging bats is considered to be at the regional scale and at the local, district or parish scale for commuting bats according to the guidance produced by Wray, 2010. It will be necessary to provide

mitigation measures for the loss of these features to ensure that the favourable conservation status of bats is maintained.

4.8 The retention of the external boundary features will ensure that connectivity to the locality is maintained as well as foraging and commuting habitats. A suitable buffer zone from these boundaries will be required to minimise disturbance levels. This should be protected during the works by tree protection fencing that conforms to the British Standard (BS 5837:2012). Full details of this are detailed in the Tree Survey Report.

4.9 It is proposed that suitable replacement foraging and commuting features are planted along the southern and western boundaries of the proposed extension. This should be in the form of intact species-rich hedgerows and/or broad-leaved woodland. Where new woodland is to be created, a minimum of a 10m belt of woodland should be planted to replicate the woodland being removed. A similar species composition as in the woodland to be removed should be planted and native locally sourced species should be used where possible.

4.10 In order to ensure that bats use the commuting and foraging features that are to be retained, it is strongly recommended that any lighting used on the site is kept to a minimum and is carefully designed in order to prevent light spilling onto foraging and commuting features (please see below for recommendations). Lighting should be avoided in close proximity to all ancient woodland and broad-leaved semi-natural woodland, and should be mitigated in proximity to other external boundary habitats.

4.11 Artificial lighting has been found to affect the feeding behaviour of bats in two ways; one is the attraction that light from certain types of lamps has to a range of insects; the other is the presence of lit conditions posing a barrier to movement (ILP, 2018). With regard to insects, the increase in insects around certain types of lighting can favour bats which are more tolerant to light (Pipistrelle species, noctule, Leisler's bat and serotine). However the slower-flying broad winged species such as Myotis, long-eared, barbastelle and horseshoe bats generally avoid street light and are then put at a competitive disadvantage and are less able to forage successfully and efficiently which can have a significant impact upon fitness and breeding success. Lighting can also have negative impacts on drinking resources for bats, faster flying species and

commuting features and roosting sites as well as increasing predation levels (ILP, 2018).

4.12 As lesser horseshoe, brown long-eared and Myotis bats have been recorded within the site, lighting around the external boundaries must be restricted and only used where it is an essential requirement.

4.13 It is recommended that the following approach towards lighting is adopted where any new lighting is installed on the proposed western extension or existing site. The recommendations have been taken from the Institution of Lighting Professionals 'Bats and Artificial Lighting in the UK, Bats and the Built Environment series' document which was produced in 2018:

- All luminaries should lack EV elements when manufactured. Metal halide, fluorescent sources should not be used.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally <2700 Kelvin) should be adopted to reduce blue light component).
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill.
- Column height should be carefully considered to minimise light spill.
- Only luminaires with an upward light ratio of 0% and with good optical control should be used.
- Luminaires should always be mounted on the horizontal, i.e no upward tilt.
- Any external security lighting should be set on motion-sensors and short (1 minute) timers.
- As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

4.14 The above mitigation measures are considered necessary and proportionate given the species recorded on the site and the likely impacts predicted as a result of the development.

Enhancements

4.15 Upon completion of the extraction of the whole site, restoration will be to calcareous grassland with naturally regenerated scrub and trees on quarry benches. The scrub and trees will provide suitable habitat for foraging and commuting bats. A management plan should be put in place to ensure the longevity of these features to provide the greatest benefits to bats and other wildlife.

4.16 The loss of potential bat roosting features in the form of the standard trees is discussed in the separate bat roost survey report (Pleydell Smithyman Limited, 2019).

5.0 REFERENCES

1. BCT, (2009). *Bats and Lighting in the UK, Bats and the Built Environment Series*. Bat Conservation Trust.
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5. Pleydell Smithyman Limited (2019). *Bat Roost Survey relating to land at The Proposed Western Extension at Denbigh Quarry, Denbighshire*. Pleydell Smithyman Limited, Ironbridge.
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8. Russ J. (2012).*British bat calls: A Guide to Species Identification,* Pelagic Publishing, Exeter.
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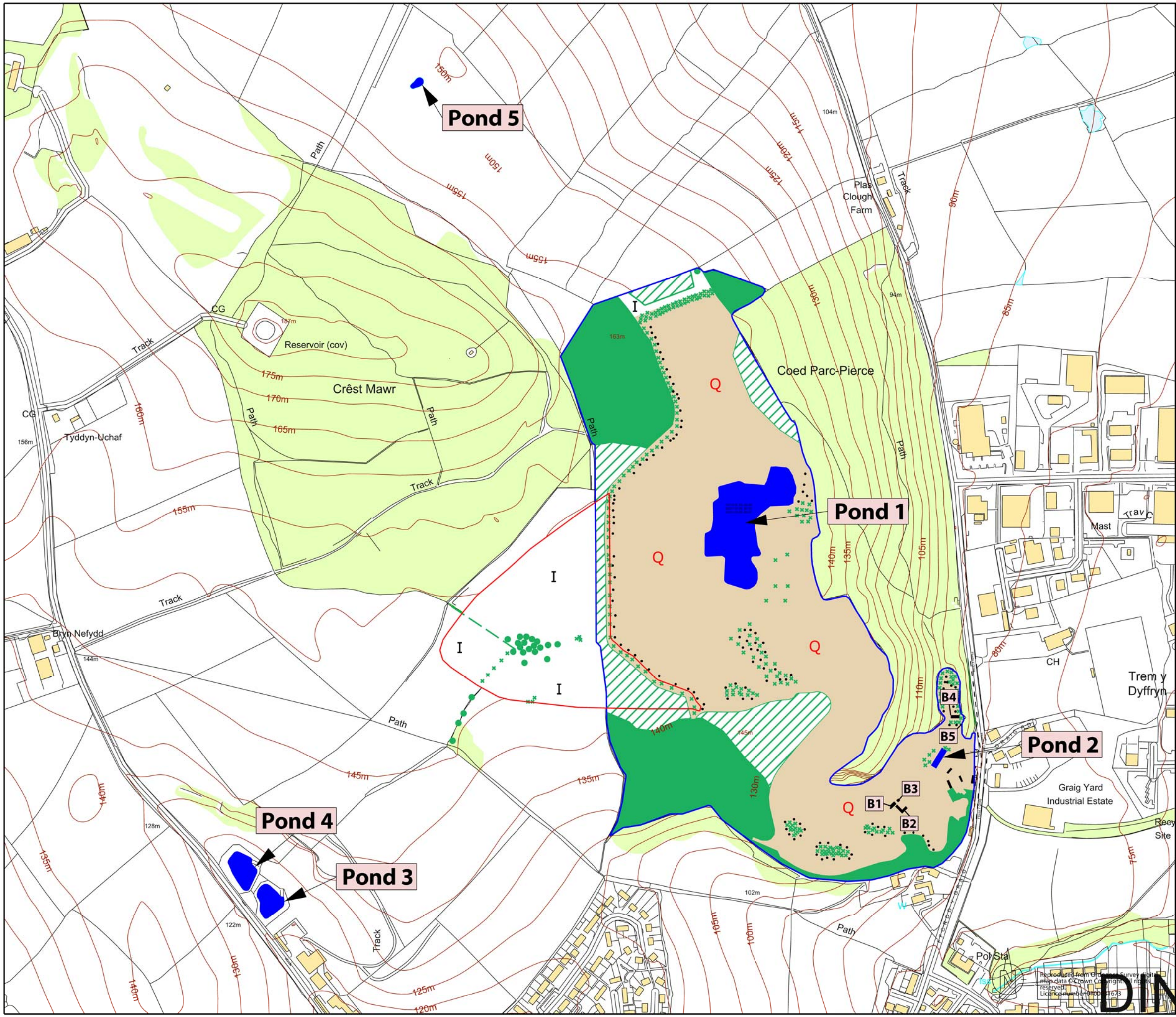
DRAWINGS

DRAWING M18.155.D.014

Preliminary Ecological Appraisal



Legend

- Land under control of the applicant
- Limit of extension
- Broad-leaved Semi-natural Woodland
- Broad-leaved Plantation Woodland
- Scattered Scrub
- Scattered Tree
- I Improved Grassland
- Standing Water
- Q Quarry
- Ephemeral/Short Perennial
- Species-poor Defunct Hedgerow
- Building

DRAWING STATUS	
PROJECT **Denbigh Quarry**	
CLIENT **Breedon Southern Ltd**	
TITLE **Preliminary Ecological Appraisal**	
DATE **Oct 2019**	SCALE **1:5,000 @A3**
DRAWN **KH**	CHECKED **RH**
DRAW NO. **M18.155.D.014**	

PleydellSmithyman

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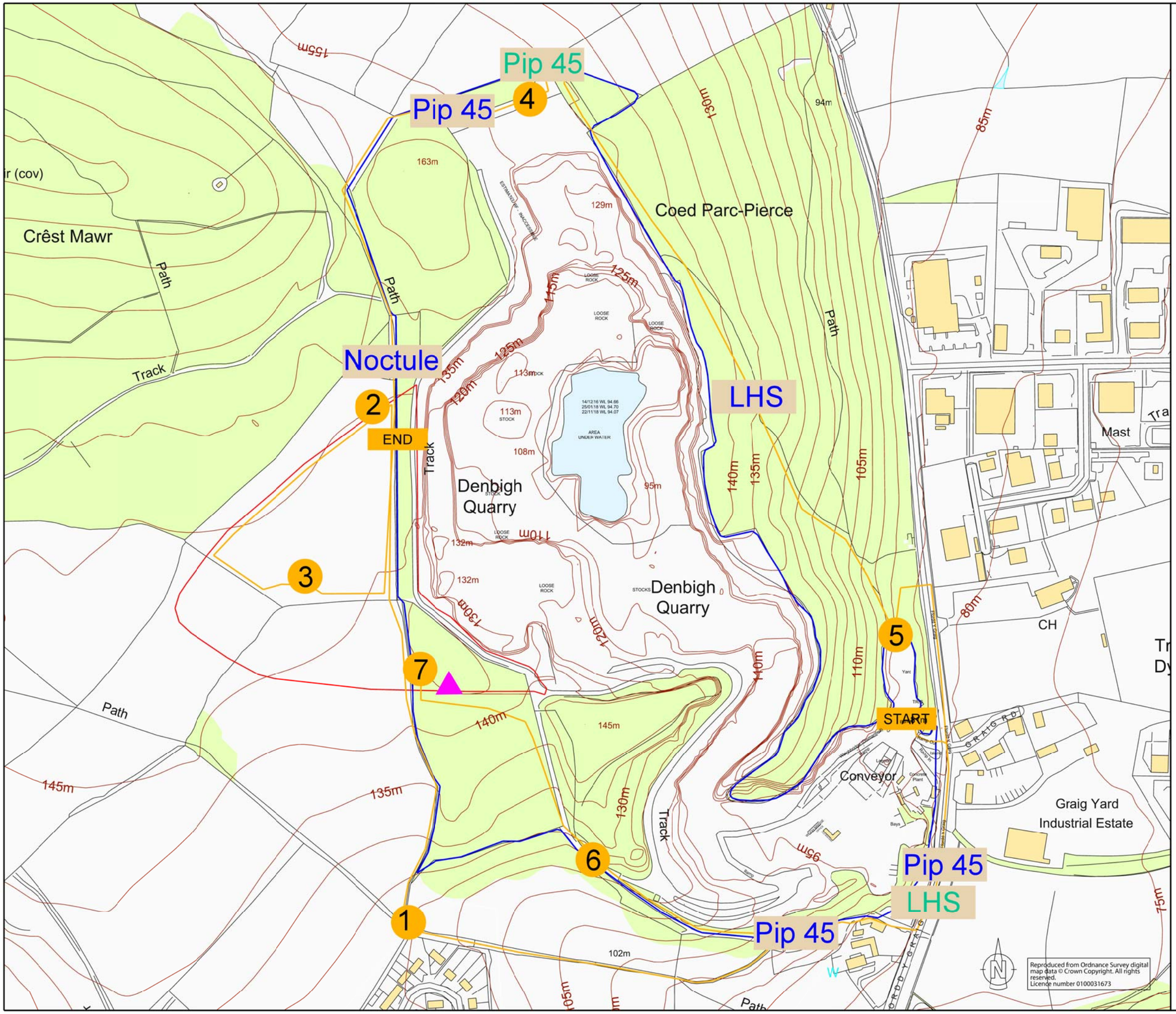
DRAWING M18.155.D.021

Bat Activity Survey 21-5-2019



Legend

- Land under control of the applicant
- Limit of extension
- Static Detector Location
- 1 — Transect Route and Stop Point
- Start — Transect Start Point
- End — Transect End Point
- Bat — Bat recorded with rare activity levels (1 pass)
- Bat — Bat recorded with occasional activity levels (2-3 passes)
- LHS — Lesser Horseshoe Bat heard or seen
- Noctule — Noctule bat heard or seen
- Pip 45 — Common pipistrelle heard or seen

REV	AM'D	NOTES	DATE

DRAWING STATUS
PLANNING

PROJECT
Denbigh Quarry

CLIENT
Breedon Southern Ltd

TITLE
Bat Activity Survey 21-5-2019

DATE	SCALE
Oct 2019	**1:3,500 @A3**
DRAWN **KH**	CHECKED **RH**

DRAW NO.
M18.155.D.021

PleydellSmithyman

DRAWING M18.155.D.022

Bat Activity Survey 13-8-2019

Bat Key

Leis = Leisler's bat heard/seen
LHS = Lesser horseshoe bat heard/seen
Noctule = Noctule bat heard/seen
Pip 45 = Common pipistrelle bat heard/seen
Pip 55 = Soprano pipistrelle bat heard/seen
Sero = Serotine bat heard/seen

Crêst Mawr
Coed Parc-Pierce
Denbigh Quarry
Graig Yard Industrial Estate
Conveyor
Mast
CH
Path
Track
AREA UNDER WATER
14/12/16 WL 94.66
25/01/18 WL 94.70
22/11/18 WL 94.07
LOOSE ROCK
STOCK
STOCKS
ESTIMATED INACCESSIBLE
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Pip 45
Leis
Pip 55
Sero
Pip 55
LHS
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Pip 55
Pip 45
Pip 45
Pip 55
Noctule
LHS
Pip 55

1 2 3 4 5 6 7 8 9
START
END

Legend

- Land under control of the applicant
- Limit of extension
- Static Detector Location
- 1 — Transect Route and Stop Point
- Start — Transect Start Point
- End — Transect End Point
- Bat — Bat recorded with rare activity levels (1 pass)
- Bat — Bat recorded with occasional activity levels (2-3 passes)
- Bat — Bat recorded with frequent activity levels (4-6 passes)
- Bat — Bat recorded with constant activity levels

REV	AM'D	NOTES	DATE

DRAWING STATUS
PLANNING

PROJECT
Denbigh Quarry

CLIENT
Breedon Southern Ltd

TITLE
Bat Activity Survey 21-5-2019

DATE	SCALE
Oct 2019	**1:3,500 @A3**
DRAWN **KH**	CHECKED **RH**

DRAW NO.
M18.155.D.021

PleydellSmithyman

PLEYDELL SMITHYMAN LIMITED
20A THE WHARFAGE, IRONBRIDGE
SHROPSHIRE TF8 7NH
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E. psl@pleydellsmithyman.co.uk
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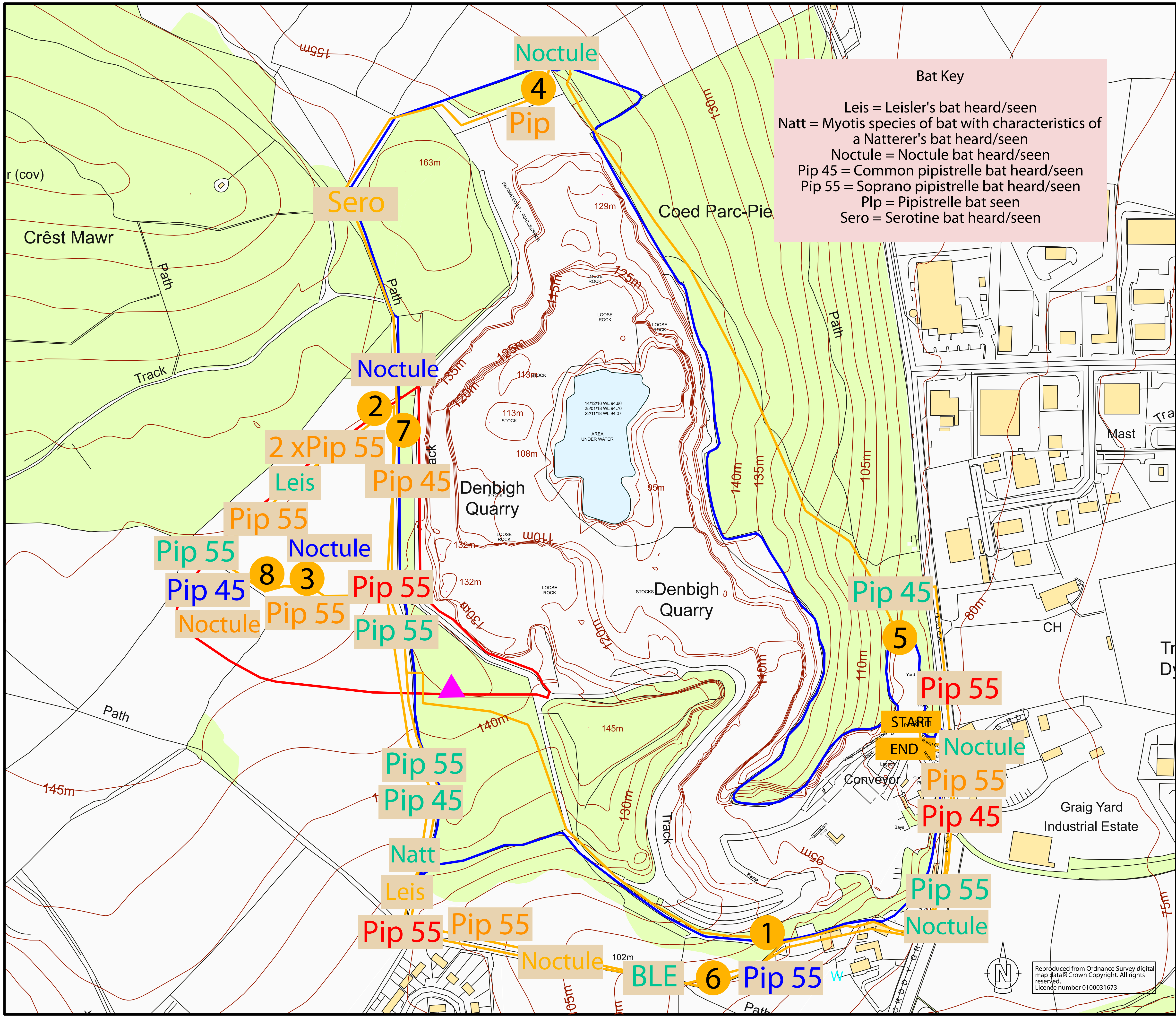
DRAWING M18.155.D.023

Bat Activity Survey 24-9-2019



Legend

Blue outline	Land under control of the applicant
Red outline	Limit of extension
Magenta triangle	Static Detector Location
1	Transect Route and Stop Point
Start	Transect Start Point
End	Transect End Point
Bat (blue)	Bat recorded with rare activity levels (1 pass)
Bat (green)	Bat recorded with occasional activity levels (2-3 passes)
Bat (orange)	Bat recorded with frequent activity levels (4-6 passes)
Bat (red)	Bat recorded with constant activity levels

REV	AM'D	NOTES	DATE

DRAWING STATUS
PLANNING

PROJECT
Denbigh Quarry

CLIENT
Breedon Southern Ltd

TITLE
Bat Activity Survey
21-5-2019

DATE	SCALE
Oct 2019	1:3,500 @A3

DRAWN	CHECKED
KH	RH

DRAW NO.
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APPENDICES

APPENDIX 1

Information obtained from Cofnod
(North Wales Environmental Information Service)

Cofnod Environmental Information Search (PUBLIC VERSION)

Our Reference	E07248
Your Reference	M18.155
Requested By	Pleydell Smithyman Limited
Data Users	Kelly Hopkins, Ecologist / Ecological Co-ordinator, Pleydell Smithyman Limited Jo Davies, Planning and Estates Manager, Breedon
Search Date	08/04/2019
Expiry Date	08/10/2019
Search Type	Chargeable

Important Issues

- Use of the data is governed by Cofnod's Terms & Conditions.
- Data marked as confidential or sensitive must not be released into the public domain, with the exception of the Public Version of the PDF report, which has had sensitive information removed or restricted.
- You should not amend any part of the downloaded records.
- Unless otherwise agreed, use of the data is valid until the Expiry Date (08/10/2019).
- The data was generated on the Search Date (08/04/2019) and is not live.
- The Dataset ID associated with each record can be used to find information about the provenance of the data. Verification Levels are given for each record. Refer to individual LERCs for further metadata and policies relating to the data.
- Please contact us if you have any questions about using the data or wish to add further Data Users.

Notes

- Cofnod uses a search system which optionally reports species (usually high priority or protected species) within a specified search radius or buffer. Where required a search will also include high priority 'Mobile Species', such as bats, otters, amphibians and certain invertebrates, which lie outside the specified search radius. These species are highlighted on the report with **(Mobile)** next to the distance. They have been selected as 'Mobile Species' as their territory (possibly due to foraging activity or life cycle) could intersect with the search radius.
- Records with 4 figure grid references are displayed as 1km squares on any relevant maps. They are highlighted with (1km) next to the distance.
- Records shown in **bold** typeface are sensitive species records, and some details have been restricted in this public version of the report.

Data Description

Distance	Indicates the distance, in metres, between the GRID REFERENCE of the record (using the central point of the grid square) and the search location. For any Sensitive Species Records, this cannot be released into the Public Domain.
Species Name	Name of the taxon (usually identified to species level) using the binomial system.
Grid Reference	Full grid reference based on the Ordnance Survey grid system. For any Sensitive Species Records, this cannot be released into the Public Domain.
Date	Date on which the record was made. In some cases this might be a date range, or a vague date such as 'Summer 2010'.
Recorder(s)	One or more people who made the original observation and recorded it in some way. It may have subsequently been included in a data collation by another person or it may have been submitted to Cofnod directly.
Abundance	Number of individuals recorded. Where not specified it is assumed that at least one was present.
Record Type	The recording methods used (only where specified).
Site Name	The site name (if one has been supplied). For any Sensitive Species Records, this cannot be released into the Public Domain.
Comments	Any additional notes about the sighting, including any information on habitat or substrate if this is available. For any Sensitive Species Records, this cannot be released into the Public Domain.
Dataset ID	ID of this dataset. See 'Important Issues' for more details.
Lists	Any local, national or international conservation statuses or legal protection which apply to this species and whether it is included in any Local Biodiversity Action Plans. See 'Abbreviations' for more details.
V	Summarised record Verification Level. The following codes are used: 1 - Unassessed, 2 - Unconfirmed, 3 - Considered Correct by Cofnod, 4 - Considered Correct by Expert. See our Data Quality policy, available from the Cofnod website for more details.

Abbreviations

ANG - Anglesey County Council Local Biodiversity Action Plan, **AONB** - Area of Outstanding Natural Beauty, **AW** - Ancient Woodland, **BAP** - UK Biodiversity Action Plan, **BDir1** - EU Birds Directive Annexe 1, **BDir2.1** - EU Birds Directive Annexe 2.1, **BDir2.2** - EU Birds Directive Annexe 2.2, **Bern** - Bern Convention on the Conservation of European Wildlife and Natural Habitats, **Bonn** - Bonn Convention on the Conservation of Migratory Species of Wild Animals, **CITES** - Convention on International Trade in Endangered Species of Wild Fauna and Flora, **CON** - Conwy County Borough Council Local Biodiversity Action Plan, **DEN** - Denbighshire County Council Local Biodiversity Action Plan, **EPS** - European Protected Species, **FLI** - Flintshire County Council Local Biodiversity Action Plan, **GWY** - Gwynedd County Council Local Biodiversity Action Plan, **HDir** - EU Habitats Directive, **INNS** - Invasive Non-native Species, **LBAP** - Local Biodiversity Action Plan species for the listed area, **LI** - Locally Important within the listed area, **LNR** - Local Nature Reserve, **MNR** - Marine Nature Reserve, **NNR** - National Nature Reserve, **NRW** - Natural Resources Wales Priority Species, **PBA** - Protection of Badgers Act 1992, **RD1(UK)** - Red Data Book listing for the UK based on IUCN guidelines, **RD1(Wales)** - Red Data Book listiing for Wales based on IUCN guidelines, **RD2(UK)** - Red Data Book listing for the UK not based on IUCN guidelines, **RIGS** - Regionally Important Geodiversity Site, **S7** - Environment (Wales) Act 2016 (Section 7), **SAC** - Special Area of Conservation, **SNP** - Snowdonia National Park Local Biodiversity Action Plan, **SPA** - Special Protection Area, **SSSI** - Site of Special Scientific Interest, **UKBA** - RSPB UK Birds Amber List (not based on IUCN criteria), **UKBR** - RSPB UK Birds Red List (not based on IUCN criteria), **WBA** - RSPB Welsh Birds Amber List (not based on IUCN criteria), **WBR** - RSPB Welsh Birds Red List (not based on IUCN criteria), **WCA1.1** - Wildlife & Countryside Act 1981 Schedule 1.1 (Birds which are protected at all times), **WCA1.2** - Wildlife & Countryside Act 1981 Schedule 1.2 (Birds which are protected at certain times), **WCA5** - Wildlife & Countryside Act 1981 Schedule 5 (Animals which are protected from killing and taking, possession, disturbance and sale), **WCA8** - Wildlife & Countryside Act 1981 Schedule 8 (Plants which are protected), **WCA9** - Wildlife & Countryside Act 1981 Schedule 9 (Non-native animals and plants which are established in the wild), **WRE** - Wrexham County Council Local Biodiversity Action Plan, **WS** - Wildlife Site, **WVP** - IUCN Threat Listing of Welsh Vascular Plants

Contact Us

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Mammals									
Species Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
Chiroptera (Unknown Bat / Ystlum Anhysbys)	SJ0667	13/07/1988	Recorder Name Withheld		Bat Roost	Site Name Withheld	Comments Withheld	D1486/001/01	EPS, S7, WCA5, LBAP[ANG, DEN, FLI, SNP]	3
Chiroptera (Unknown Bat / Ystlum Anhysbys)	SJ0667	13/07/1988	Recorder Name Withheld	Droppings	Bat Roost	Site Name Withheld	Comments Withheld	D1486/001/01	EPS, S7, WCA5, LBAP[ANG, DEN, FLI, SNP]	3
Chiroptera (Unknown Bat / Ystlum Anhysbys)	SJ0666	07/07/1992	Recorder Name Withheld	18	Bat Roost	Site Name Withheld	Comments Withheld	D1486/001/01	EPS, S7, WCA5, LBAP[ANG, DEN, FLI, SNP]	3
Chiroptera (Unknown Bat / Ystlum Anhysbys)	SJ0569 *(Estimated (Centroid of Site))*	2005 approx	Recorder Name Withheld			Site Name Withheld	Comments Withheld	D0132/001/02	EPS, S7, WCA5, LBAP[ANG, DEN, FLI, SNP]	4
Erinaceus europaeus (Hedgehog / Draenog)	SJ0559366426	Before October 2006	Recorder Name Withheld			Denbigh		D0971/001/01	Bern, S7, LBAP[ANG, CON, FLI, GWY]	4
Erinaceus europaeus (Hedgehog / Draenog)	SJ060671	2 records, between 2012 and 2013	Recorder Name Withheld	1	Live Sighting; Dead			D1574/001/03	Bern, S7, LBAP[ANG, CON, FLI, GWY]	3
Erinaceus europaeus (Hedgehog / Draenog)	SJ060667	2014	Recorder Name Withheld	1	Live Sighting			D1574/001/03	Bern, S7, LBAP[ANG, CON, FLI, GWY]	3
Erinaceus europaeus (Hedgehog / Draenog)	SJ046659	2008	Recorder Name Withheld			64 Myddelton Avenue, Denbigh	Garden Wildlife Record. Grid reference calculated from post code LL16 3RL, using Streetmap.	D1117/001/01	Bern, S7, LBAP[ANG, CON, FLI, GWY]	4
Erinaceus europaeus (Hedgehog / Draenog)	SJ049658	2017	Recorder Name Withheld		Live Sighting			D1688/001/03	Bern, S7, LBAP[ANG, CON, FLI, GWY]	3
Erinaceus europaeus (Hedgehog / Draenog)	SJ04716586 *(Selected from Interactive Map)*	25/09/2014	Recorder Name Withheld	1	Dead on road	Denbigh		D1383/001/01	Bern, S7, LBAP[ANG, CON, FLI, GWY]	4
Erinaceus europaeus (Hedgehog / Draenog)	SJ062668	2018	Recorder Name Withheld		Live Sighting	N/A	3 sightings reported for this grid reference with this date.	D1688/002/01	Bern, S7, LBAP[ANG, CON, FLI, GWY]	3
Erinaceus europaeus (Hedgehog / Draenog)	SJ06266648	01/06/2013	Recorder Name Withheld					D1638/001/01	Bern, S7, LBAP[ANG, CON, FLI, GWY]	3
Erinaceus europaeus (Hedgehog / Draenog)	SJ062664	01/06/2013	Recorder Name Withheld					D1596/001/02	Bern, S7, LBAP[ANG, CON, FLI, GWY]	3
Erinaceus europaeus (Hedgehog / Draenog)	SJ0639466451	2003	Recorder Name Withheld	2		3, Carm Llenenni, Myddeton Park, Denbigh	Alive	D0971/001/01	Bern, S7, LBAP[ANG, CON, FLI, GWY]	4
Erinaceus europaeus (Hedgehog / Draenog)	SJ06416618	10/05/2013	Recorder Name Withheld	1 adult		Denbigh	Roadkill, found dead. Verification Level: Certain	D1638/001/01	Bern, S7, LBAP[ANG, CON, FLI, GWY]	3
Erinaceus europaeus (Hedgehog / Draenog)	SJ064661	10/05/2013	Recorder Name Withheld			Denbigh		D1596/001/02	Bern, S7, LBAP[ANG, CON, FLI, GWY]	3
Erinaceus europaeus (Hedgehog / Draenog)	SJ0567	4 records, between 1970 and 28/07/2013	Recorder Name Withheld			Denbigh	Brought into Wrexham hedgehog rescue centre.; 2 babies brought in to Wrexham HH rescue.	D1638/001/01, D1072/001/02	Bern, S7, LBAP[ANG, CON, FLI, GWY]	3
Erinaceus europaeus (Hedgehog / Draenog)	SJ0665 *(Selected from Interactive Map)*	10/07/2012	Recorder Name Withheld	1	Dead on road	A525 coming into Denbigh	Time of sighting: 16:00	D1383/001/01	Bern, S7, LBAP[ANG, CON, FLI, GWY]	4
Lepus europaeus (Hare / Ysgyfarnog)	SJ0525065809 *(Selected from Interactive Map)*	21/06/2013	Recorder Name Withheld	1 Adult		Denbigh Castle	Sat in field behind car park	D1117/001/01	S7, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	4

Species Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
Lepus europaeus (Hare / Ysgyfarnog)	SJ038682	2 records, between 1966 and 26/12/1991	Recorder Name Withheld			Plas Heaton, Denbigh	Field	D1072/001/02, D0108/001/03	S7, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	3
Lepus europaeus (Hare / Ysgyfarnog)	SJ051691 *(Estimated (Centroid of Site))*	2005 approx	Recorder Name Withheld				Shoot Size Range: 0-3km	D0132/001/02	S7, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	1
Lepus europaeus (Hare / Ysgyfarnog)	SJ0567 *(Supplied by Original Recorder)*	08/02/2009	Recorder Name Withheld	1	Live Sighting	Denbigh	Agricultural grassland	D0108/001/03	S7, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	4
Lepus europaeus (Hare / Ysgyfarnog)	SJ0566	5 records, between 20/06/2005 and 26/06/2008	Recorder Name Withheld	1; 2	Live Sighting	Denbigh	Alive. Seen regularly = No; Once pasture land; Open fields; Alive. Seen regularly = Yes. Pasture; Dead. Seen regularly = No. Wood	D0108/001/03	S7, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	4
Lepus europaeus (Hare / Ysgyfarnog)	SJ0565	15/05/2005	Recorder Name Withheld	1		Denbigh	Alive. Seen regularly = Yes. Farmland Woods	D0108/001/03	S7, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	4
Meles meles **(Badger / Mochyn Daear)**	SJ0567	**1997**	**Recorder Name Withheld**		**Badger Sett**	**Site Name Withheld**	**Comments Withheld**	D0059/001/02	**Bern, PBA, LBAP[CON, DEN, FLI, WRE]**	**3**
Meles meles **(Badger / Mochyn Daear)**	SJ0567	**05/03/2005**	**Recorder Name Withheld**		**Badger Sett**	**Site Name Withheld**	**Comments Withheld**	D0059/001/02	**Bern, PBA, LBAP[CON, DEN, FLI, WRE]**	**3**
Meles meles **(Badger / Mochyn Daear)**	SJ0566	**1997**	**Recorder Name Withheld**		**Badger Sett**	**Site Name Withheld**	**Comments Withheld**	D0059/001/02	**Bern, PBA, LBAP[CON, DEN, FLI, WRE]**	**3**
Meles meles **(Badger / Mochyn Daear)**	SJ0567	**1997**	**Recorder Name Withheld**		**Badger Sett**	**Site Name Withheld**	**Comments Withheld**	D0059/001/02	**Bern, PBA, LBAP[CON, DEN, FLI, WRE]**	**3**
Meles meles **(Badger / Mochyn Daear)**	SJ0466	**05/03/2005**	**Recorder Name Withheld**		**Badger Sett**	**Site Name Withheld**	**Comments Withheld**	D0059/001/02	**Bern, PBA, LBAP[CON, DEN, FLI, WRE]**	**3**
Meles meles **(Badger / Mochyn Daear)**	SJ0467	**06/04/2000**	**Recorder Name Withheld**		**Badger Sett**	**Site Name Withheld**	**Comments Withheld**	D0059/001/02	**Bern, PBA, LBAP[CON, DEN, FLI, WRE]**	**3**
Meles meles **(Badger / Mochyn Daear)**	SJ0467	**06/04/2000**	**Recorder Name Withheld**		**Badger Sett**	**Site Name Withheld**	**Comments Withheld**	D0059/001/02	**Bern, PBA, LBAP[CON, DEN, FLI, WRE]**	**3**
Meles meles **(Badger / Mochyn Daear)**	SJ0465	**18/02/2011**	**Recorder Name Withheld**		**Badger Sett**	**Site Name Withheld**	**Comments Withheld**	D0059/001/02	**Bern, PBA, LBAP[CON, DEN, FLI, WRE]**	**3**
Meles meles **(Badger / Mochyn Daear)**	SJ0465	**18/02/2011**	**Recorder Name Withheld**		**Badger Sett**	**Site Name Withheld**	**Comments Withheld**	D0059/001/02	**Bern, PBA, LBAP[CON, DEN, FLI, WRE]**	**3**
Meles meles **(Badger / Mochyn Daear)**	SJ0366	**05/05/2006**	**Recorder Name Withheld**		**Badger Sett**	**Site Name Withheld**	**Comments Withheld**	D0059/001/02	**Bern, PBA, LBAP[CON, DEN, FLI, WRE]**	**3**
Myotis **(Myotis Bat Species)**	SJ0566 *(Estimated (Centroid of Site))*	**12/09/1989**	**Recorder Name Withheld**	**1 Female**	**Bat Rescue**	**Site Name Withheld**	**Comments Withheld**	D0026/276/01	**Bern, EPS, HDir, S7, WCA5, LBAP[ANG, DEN, FLI, SNP]**	**3**
Pipistrellus **(Pipistrellus Bat Species)**	SJ0566 *(Estimated (Centroid of Site))*	**05/04/1989**	**Recorder Name Withheld**	**1 Male**	**Bat Rescue**	**Site Name Withheld**	**Comments Withheld**	D0026/276/01	**EPS, WCA5, LBAP[ANG, DEN, FLI, SNP]**	**3**
Pipistrellus **(Pipistrellus Bat Species)**	SJ0466	**03/11/1993**	**Recorder Name Withheld**	**1**	**Bat Roost**	**Site Name Withheld**	**Comments Withheld**	D1486/001/01	**EPS, WCA5, LBAP[ANG, DEN, FLI, SNP]**	**3**
Pipistrellus **(Pipistrellus Bat Species)**	SJ0667	**09/07/1998**	**Recorder Name Withheld**	**1**	**Bat Roost**	**Site Name Withheld**	**Comments Withheld**	D1486/001/01	**EPS, WCA5, LBAP[ANG, DEN, FLI, SNP]**	**3**
Pipistrellus **(Pipistrellus Bat Species)**	SJ0667	**29/07/1998**	**Recorder Name Withheld**	**1 young**	**Bat Rescue**	**Site Name Withheld**	**Comments Withheld**	D1486/001/01	**EPS, WCA5, LBAP[ANG, DEN, FLI, SNP]**	**3**
Plecotus **(Long-eared Bat Species)**	SJ0666	**30/07/1986**	**Recorder Name Withheld**			**Site Name Withheld**	**Comments Withheld**	D1072/001/02	**Bern, EPS, HDir, S7, WCA5, LBAP[ANG, DEN, FLI, SNP]**	**3**

Species Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
Plecotus auritus (Brown Long-eared Bat / Ystlum Hirglust)	SJ0566	30/07/1986	Recorder Name Withheld	30-40		Site Name Withheld	Comments Withheld	D1486/001/01	Bern, EPS, HDir, RD2(UK), S7, WCA5, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	3
Plecotus auritus (Brown Long-eared Bat / Ystlum Hirglust)	SJ0468	03/11/1992	Recorder Name Withheld	Droppings	Bat Roost	Site Name Withheld	Comments Withheld	D1486/001/01	Bern, EPS, HDir, RD2(UK), S7, WCA5, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	3

APPENDIX 2

Full details of bat activity surveys and static detector data

Activity Survey 1 – 21/5/2019

Project / Location	Denbigh Quarry	**Date**	21/5/2019
Surveyors	Kelly Hopkins and George Hicks		
Sun Set	n/a	**Sun Rise**	05.07
Survey Start	02.54	**Survey End**	05.08
Start Temperature	8.1˚C	**End Temperature**	7.9°C
Other Weather Conditions **(levels of cloud cover, precipitation, wind)**	Dry, still (Beaufort Scale 0), 25% cloud cover		
Bat Detector	EM3, EM Touch 2 Pro and Bat Box Duet		

Time	**Listening Stop Point**	**Species**	**Levels of Activity * (Rare, Occasional, Frequent, Constant)**	**Behaviour**	**Details**
03.28	2	Noctule	Rare	Commuting	Heard not seen
03.50	3-4	Common Pipistrelle (Pip 45)	Rare	Commuting	Heard not seen
03.55	4	Pip 45	Occasional	Foraging	Heard not seen
04.13	4-5	Lesser Horseshoe	Rare	Commuting	Heard not seen
04.36	5-6	Pip 45	Rare	Commuting	Heard not seen

04.36	5-6	Lesser Horseshoe	Occasional	Commuting	Heard not seen
04.38	5-6	Pip 45	Rare	Commuting	Heard not seen

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Activity Survey 2 –13th August 2019 (dusk)

Project / Location	Denbigh Quarry	**Date**	13/8/2019
Surveyors	Kelly Hopkins and Rosie Marston		
Sun Set	20.46	**Sun Rise**	n/a
Survey Start	20.46	**Survey End**	22.55
Start Temperature	18.6°C	**End Temperature**	16.9°C
Other Weather Conditions **(levels of cloud cover, precipitation, wind)**	Occasional rain showers, 90% cloud cover, light breeze (Beaufort Scale 2)		
Bat Detector	EM Touch 2 Pro and Bat Box Duet		

Time	**Listening Stop Point**	**Species**	**Levels of Activity * (Rare, Occasional, Frequent, Constant)**	**Behaviour**	**Details**
21.17	3	Pip 45	Constant	Foraging	Around tree canopy
21.21	3-4	Pip 55	Occasional	Commuting	Heard not seen
21.22	3-4	Pip 45	Occasional	Foraging	Heard not seen
21.25-21.28	4	Serotine	Constant	Foraging	Around tree canopy
21.30	4-5	Pip 55	Occasional	Foraging	Heard not seen
21.32	4-5	Leisler's	Occasional	Foraging	Heard not seen

21.35	5	Pip 45	Occasional	Foraging	Heard not seen
21.41	5-6	Pip 55	Occasional	Foraging	Heard not seen
21.43	5-6	Noctule	Rare	Commuting	Heard not seen
21.49	5-6	Lesser Horseshoe	Rare	Commuting	Heard not seen
22.00	6-7	Pip 55	Frequent	Foraging and Socialising	Heard not seen
22.00-22.01	6-7	Pip 45	Constant	Foraging	Heard not seen
22.06	6-7	Pip 45	Occasional	Foraging	Heard not seen
22.11	7	Noctule	Rare	Commuting	Heard not seen
22.11	7	Lesser Horseshoe	Rare	Commuting	Heard not seen
22.18-22.19	8	Pip 45	Frequent	Foraging	Heard not seen
22.23	8-9	Pip 55	Occasional	Foraging	Heard not seen
22.48	9-End	Pip 55	Frequent	Foraging	Heard not seen
22.51-22.53	9-End	Pip 45	Frequent	Foraging	Heard not seen
22.52	9-End	Pip 55	Occasional	Foraging	Heard not seen

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Activity Survey 3 – 24th September 2019 (Dusk)

Project / Location	Denbigh Quarry	**Date**	24/9/2019
Surveyors	Kelly Hopkins and Rosie Marston		
Sun Set	19.08	**Sun Rise**	n/a
Survey Start	19.08	**Survey End**	21.12
Start Temperature	17°C	**End Temperature**	16.5°C
Other Weather Conditions **(levels of cloud cover, precipitation, wind)**	Dry, 75% cloud cover, light breeze (Beaufort Scale 2)		
Bat Detector	EM Touch 2 Pro		

Time	**Listening Stop Point**	**Species**	**Levels of Activity * (Rare, Occasional, Frequent, Constant)**	**Behaviour**	**Details**
19.31	2	Pip 55	Frequent	Foraging	Two bats seen crossing in front of surveyors
19.34	2	Noctule	Rare	Commuting	Heard not seen
19.36	2-3	Pip 55	Frequent	Foraging	Seen flying in front of surveyors
19.39	3	Pip 55	Frequent	Foraging	Heard not seen
19.42	3	Noctule	Rare	Commuting	Heard not seen
19.46	3-4	Pip 45	Frequent	Foraging	Heard not seen

19.47	3-4	Pip 45	Frequent	Foraging	Along path
19.48	3-4	Noctule	Rare	Commuting	Heard not seen
19.49	3-4	Serotine	Frequent	Foraging	Around trees
19.55	4	Noctule	Occasional	Foraging	Heard not seen
19.57	4	Pip sp.	Rare	Commuting	Bat seen fly overhead. No calls recorded on the detector.
20.12	5	Pip 45	Occasional	Foraging	Heard not seen
20.16	5-6	Pip 55	Constant	Foraging	Heard not seen
20.19	5-6	Pip 55	Occasional	Foraging	Heard not seen
20.19	5-6	Noctule	Occasional	Foraging	Heard not seen
20.25	6	Pip 55	Rare	Commuting	Heard not seen
20.29	6-7	Noctule	Frequent	Foraging	Heard not seen
20.31	6-7	Leisler's	Frequent	Foraging	Heard not seen
20.31	6-7	Myotis sp. with characteristics of Natterer's	Occasional	Foraging	Heard not seen
20.32	6-7	Pip 45	Occasional	Foraging	Heard not seen

20.37	6-7	Pip 55	Occasional	Foraging	Heard not seen
20.45	7-8	Leisler's	Occasional	Foraging	Heard not seen
20.47	7-8	Pip 55	Occasional	Foraging	Heard not seen
20.50	8	Pip 45	Rare	Commuting	Heard not seen
20.50-20.52	8	Noctule	Frequent	Foraging	Heard not seen
20.51	8-End	Pip 55	Frequent	Foraging and Social Calls	Heard not seen
20.52	8-End	Pip 55	Constant	Foraging	Heard not seen
20.57	8-End	Pip 55	Occasional	Foraging	Heard not seen
20.58-20.59	8-End	Pip 55	Constant	Foraging	Heard not seen
21.00-21.01	8-End	Pip 55	Frequent	Foraging and Social Calls	Heard not seen
21.03	8-End	Brown long-eared	Occasional	Social Calls	Heard not seen
21.05-21.07	8-End	Pip 45	Constant	Foraging	Heard not seen
21.05-21.06	8 – End	Pip 55	Frequent	Foraging	Heard not seen
21.05	8-End	Noctule	Occasional	Foraging	Heard not seen

* Levels of activity are defined as Rare (1 pass), Occasional (2-3 passes), Frequent (4-6 passes), Constant (constant).

Static Detector Results

The below table details the species recorded by the static detectors that were placed on the site in May, June and September 2019 and their respective number of passes per season.

Species	**Number of passes during Spring**	**Number of passes during Summer**	**Number of passes during Autumn**
Common pipistrelle	46	2	0
Noctule	6	2	0
TOTAL	52	4	0

C	Type	Y	M	D	H	M	Date	Loc	Species
T5212147.56#		132	2019	5	21	21	47		cpip
T5212205.47#		132	2019	5	21	22	5		cpip
T5212213.30#		132	2019	5	21	22	13		cpip
T5212238.09#		132	2019	5	21	22	38		Nyctalus
T5212335.03#		132	2019	5	21	23	35		cpip
T5212335.20#		132	2019	5	21	23	35		cpip
T5212337.56#		132	2019	5	21	23	37		cpip
T5212341.41#		132	2019	5	21	23	41		cpip
T5220010.51#		132	2019	5	22	0	10		cpip
T5220011.29#		132	2019	5	22	0	11		cpip
T5220012.11#		132	2019	5	22	0	12		cpip
T5220012.19#		132	2019	5	22	0	12		cpip
T5220013.11#		132	2019	5	22	0	13		cpip
T5220023.01#		132	2019	5	22	0	23		cpip
T5220023.17#		132	2019	5	22	0	23		cpip
T5220031.19#		132	2019	5	22	0	31		cpip
T5220105.56#		132	2019	5	22	1	5		cpip
T5220117.56#		132	2019	5	22	1	17		cpip
T5220118.17#		132	2019	5	22	1	18		cpip
T5220254.10#		132	2019	5	22	2	54		cpip
T5220407.13#		132	2019	5	22	4	7		cpip
T5220407.32#		132	2019	5	22	4	7		cpip
T5220423.02#		132	2019	5	22	4	23		cpip
T5220430.21#		132	2019	5	22	4	30		cpip
T5222211.24#		132	2019	5	22	22	11		cpip
T5222222.21#		132	2019	5	22	22	22		cpip
T5222222.39#		132	2019	5	22	22	22		cpip
T5222222.54#		132	2019	5	22	22	22		cpip
T5222314.22#		132	2019	5	22	23	14		cpip
T5230412.10#		132	2019	5	23	4	12		cpip
T5230419.43#		132	2019	5	23	4	19		cpip
T5230422.11#		132	2019	5	23	4	22		cpip
T5232150.42#		132	2019	5	23	21	50		cpip
T5232150.50#		132	2019	5	23	21	50		cpip
T5232341.35#		132	2019	5	23	23	41		cpip
T5240409.02#		132	2019	5	24	4	9		cpip
T5240409.13#		132	2019	5	24	4	9		cpip
T5240411.03#		132	2019	5	24	4	11		cpip
T5240411.30#		132	2019	5	24	4	11		cpip
T5240411.43#		132	2019	5	24	4	11		cpip
T5240415.21#		132	2019	5	24	4	15		cpip
T5240424.26#		132	2019	5	24	4	24		cpip
T5242245.15#		132	2019	5	24	22	45		Nyctalus
T5242257.54#		132	2019	5	24	22	57		Nyctalus
T5242309.39#		132	2019	5	24	23	9		cpip
T5250347.20#		132	2019	5	25	3	47		cpip
T5250357.34#		132	2019	5	25	3	57		cpip
T5250427.23#		132	2019	5	25	4	27		cpip
T5252154.12#		132	2019	5	25	21	54		Nyctalus
T5252159.00#		132	2019	5	25	21	59		cpip
T5252233.34#		132	2019	5	25	22	33		Nyctalus
T5252341.25#		132	2019	5	25	23	41		Nyctalus

Name	Type	Y	M	D	H	M	S	Species
T6152240.02#	132	2019	6	15	22	40	2	Cpip
T6152246.42#	132	2019	6	15	22	46	42	Cpip
T6152354.14#	132	2019	6	15	23	54	14	Nyctalus
T6172225.25#	132	2019	6	17	22	25	25	Nyctalus

APPENDIX 3

Example Bat Calls

Example Bat Calls

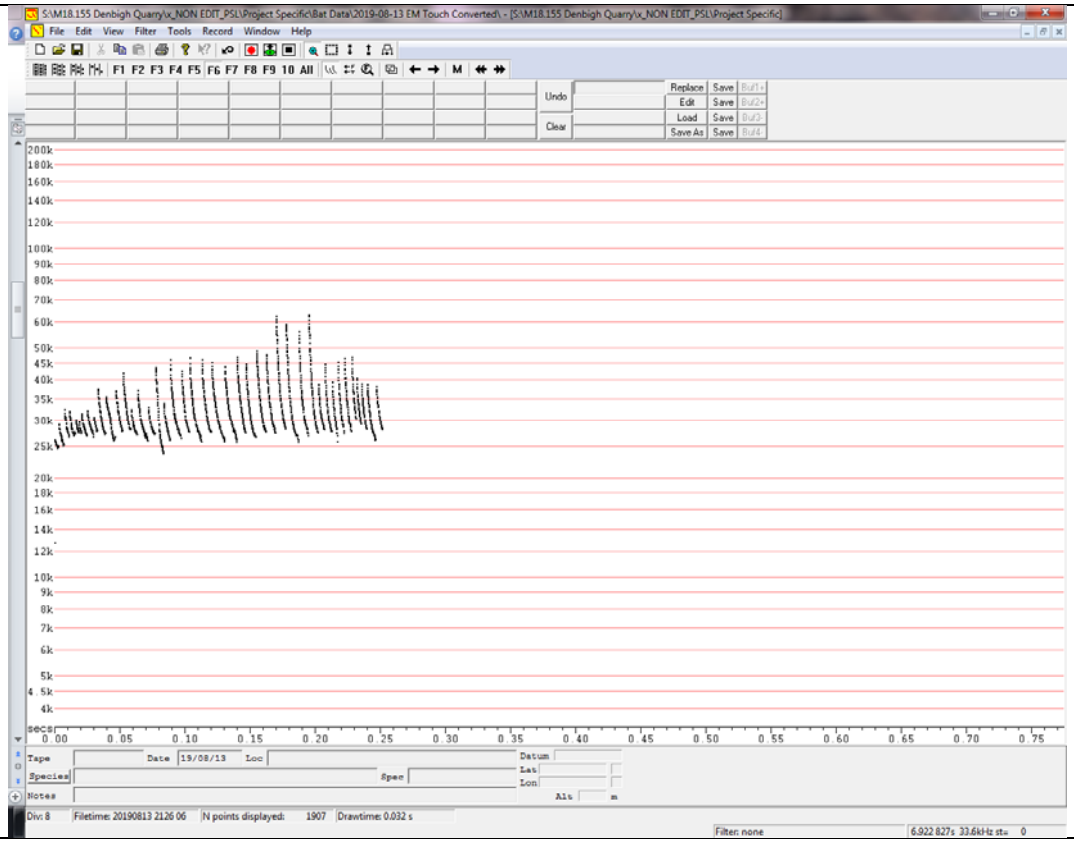

Plate 1. Example serotine call

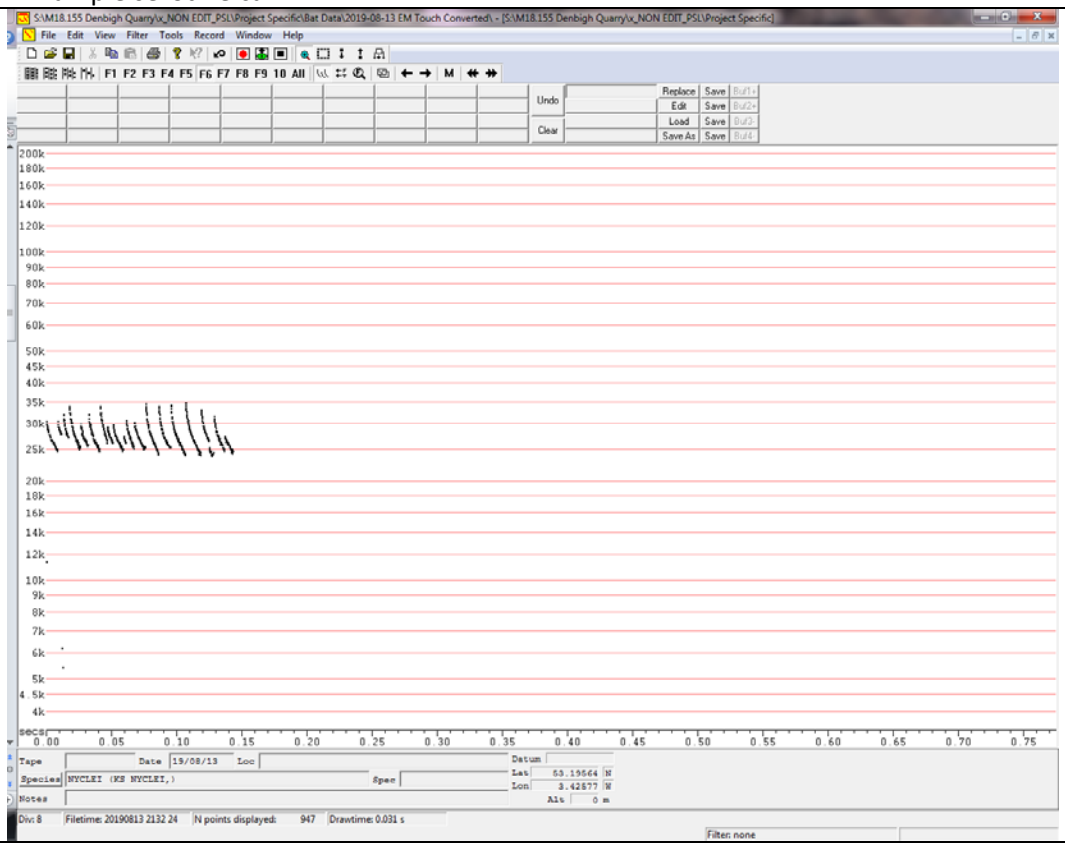

Plate 2. Example Leisler's call

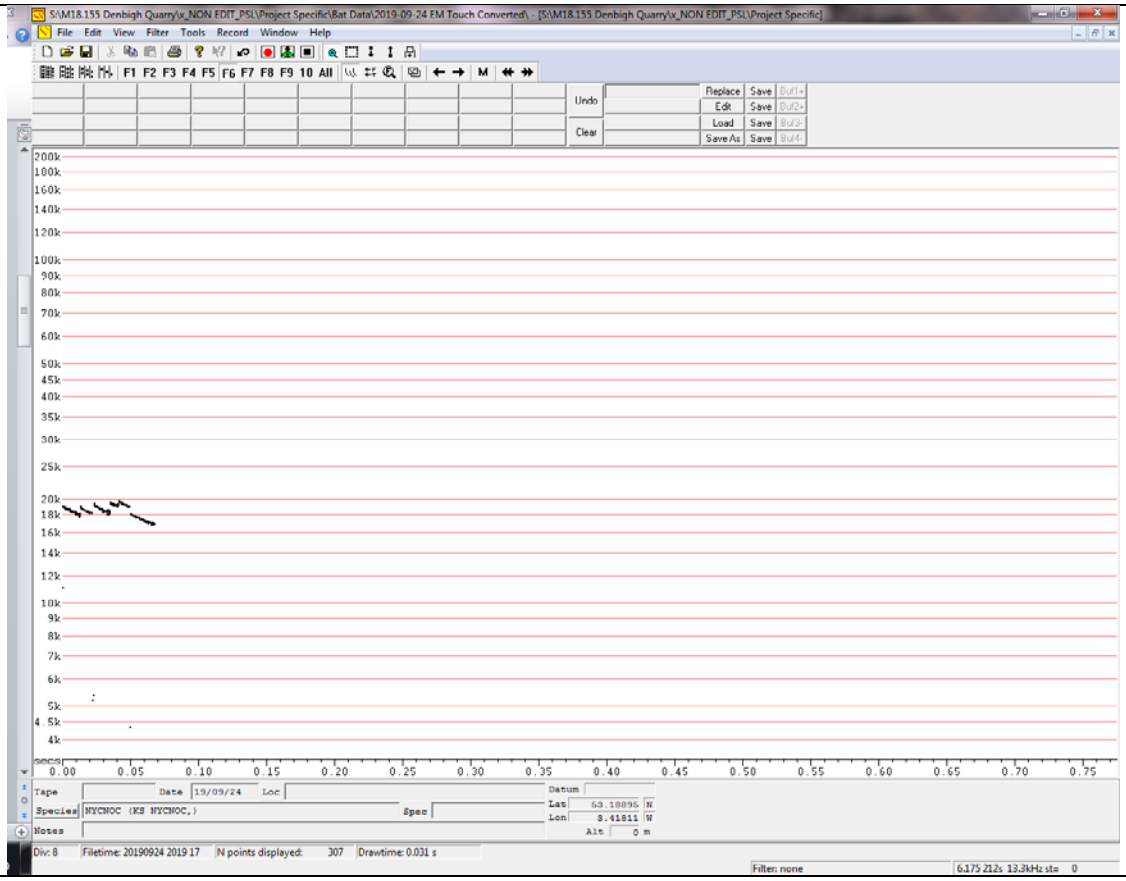

Plate 3. Example noctule call

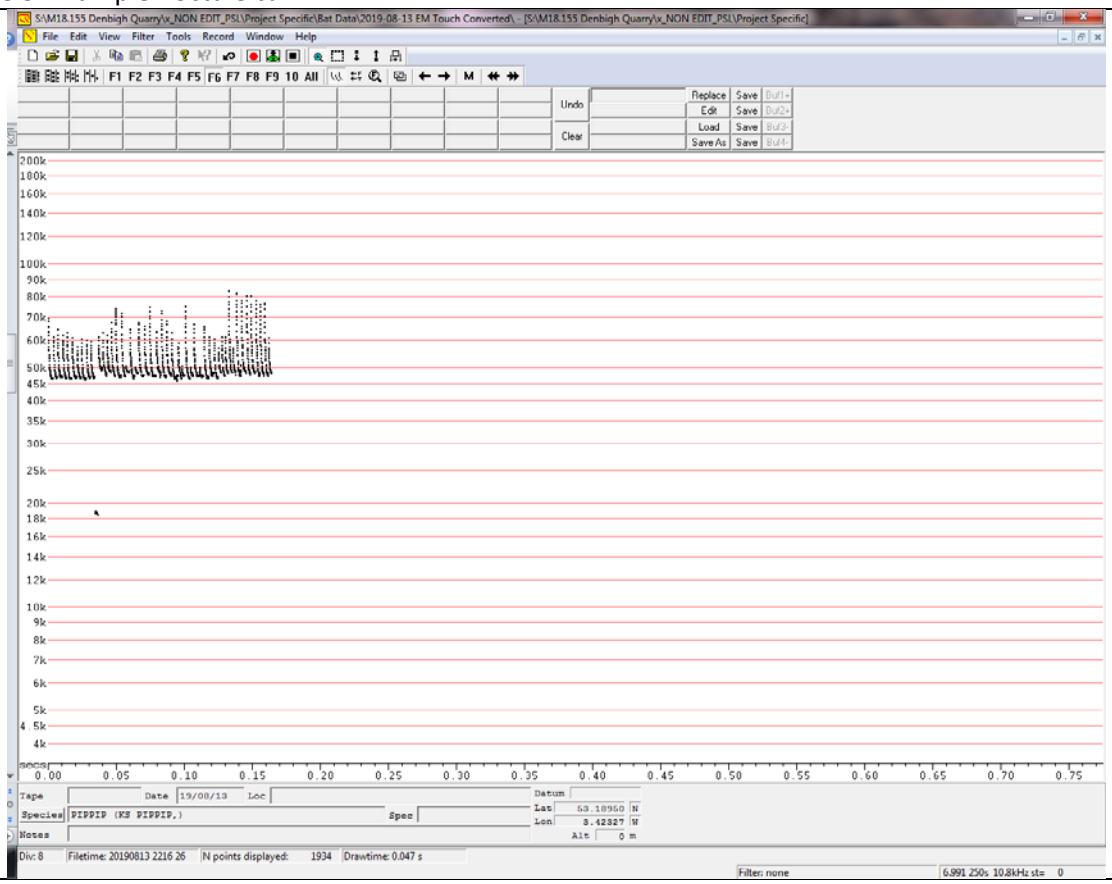

Plate 4. Example common pipistrelle call

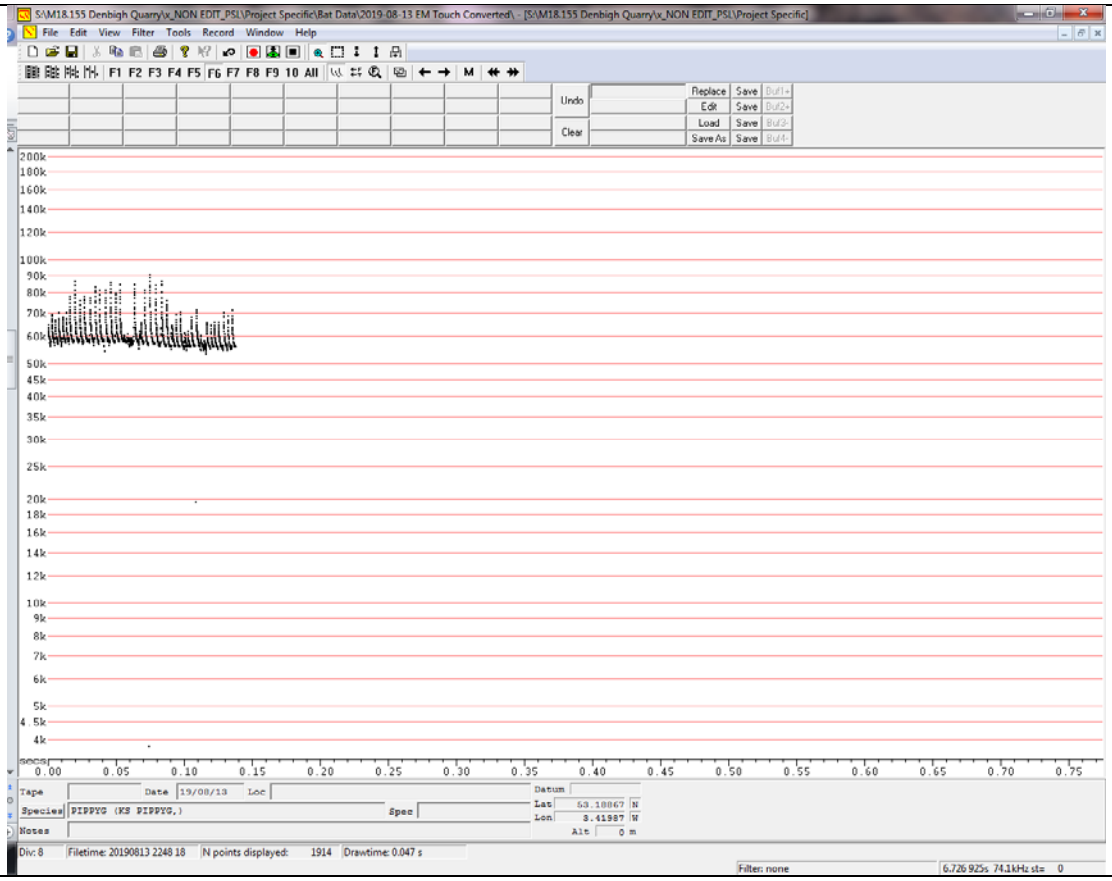

Plate 5. Example soprano pipistrelle call

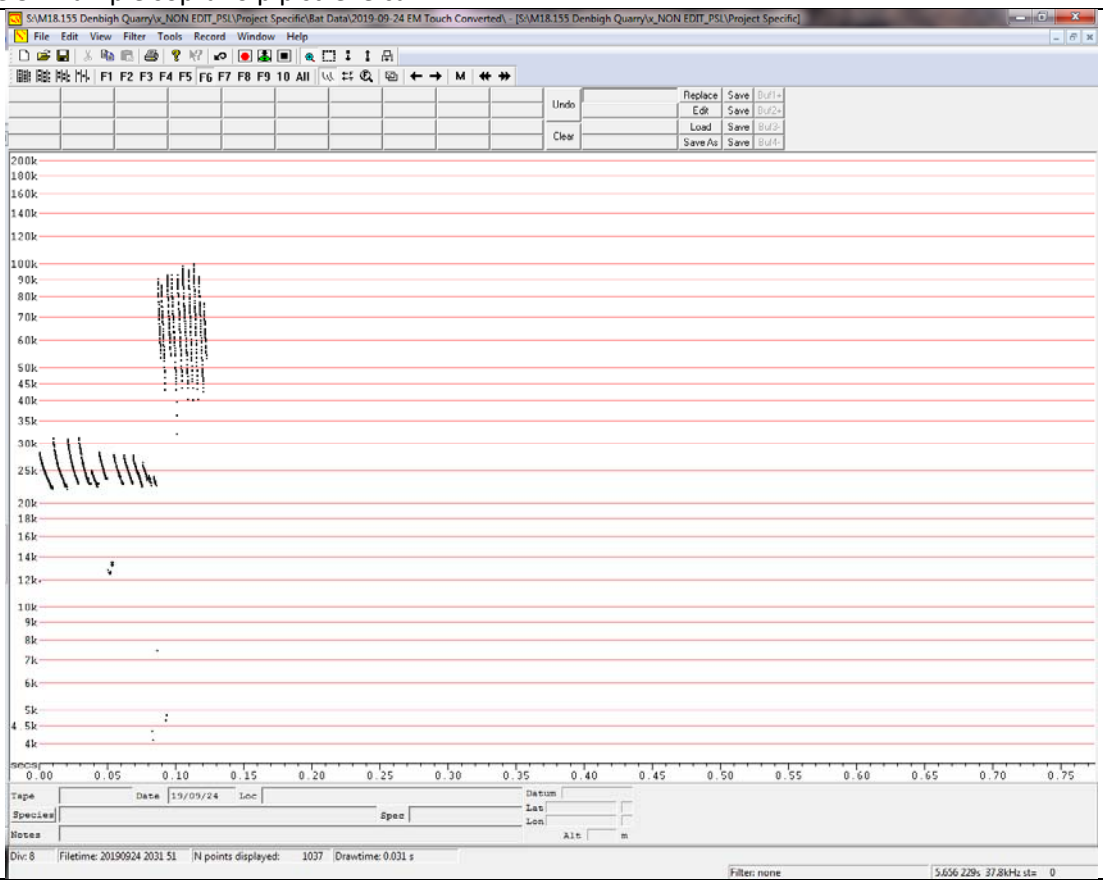

Plate 6. Example Myotis call with characteristics of Natterer's

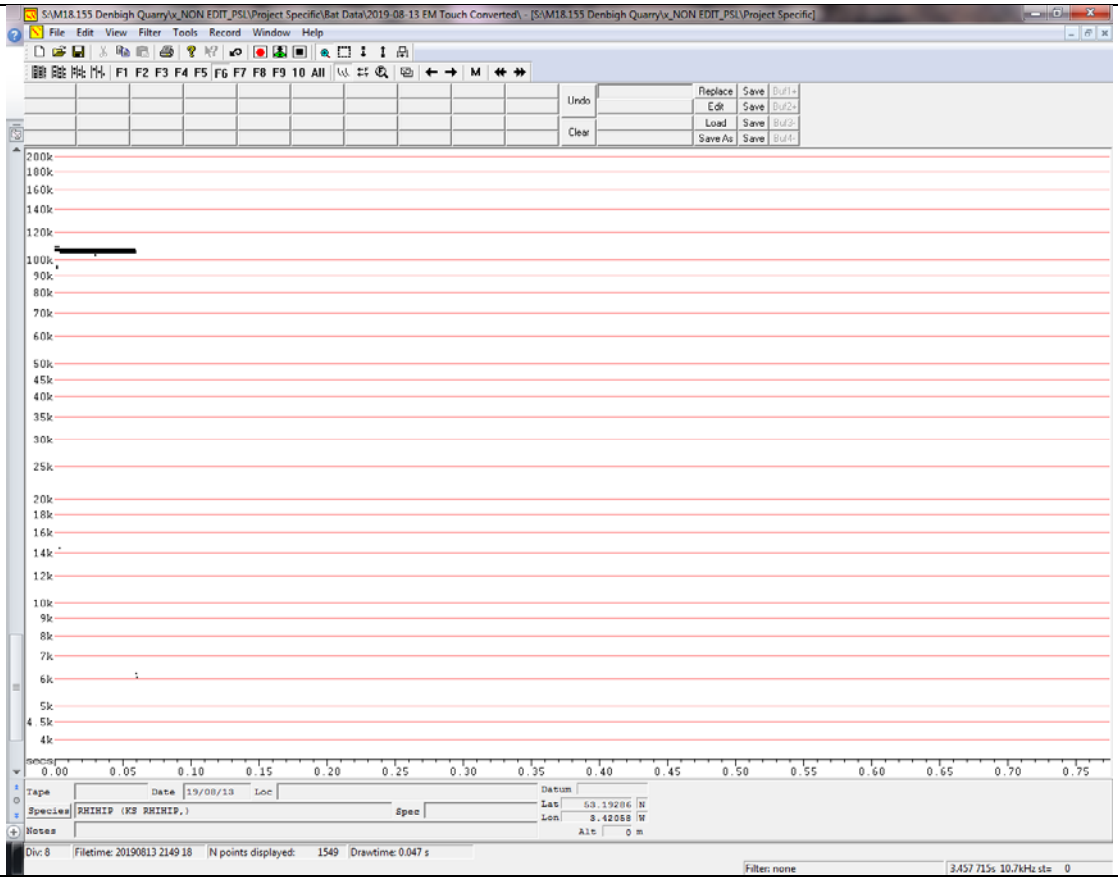

Plate 7. Example lesser horseshoe call

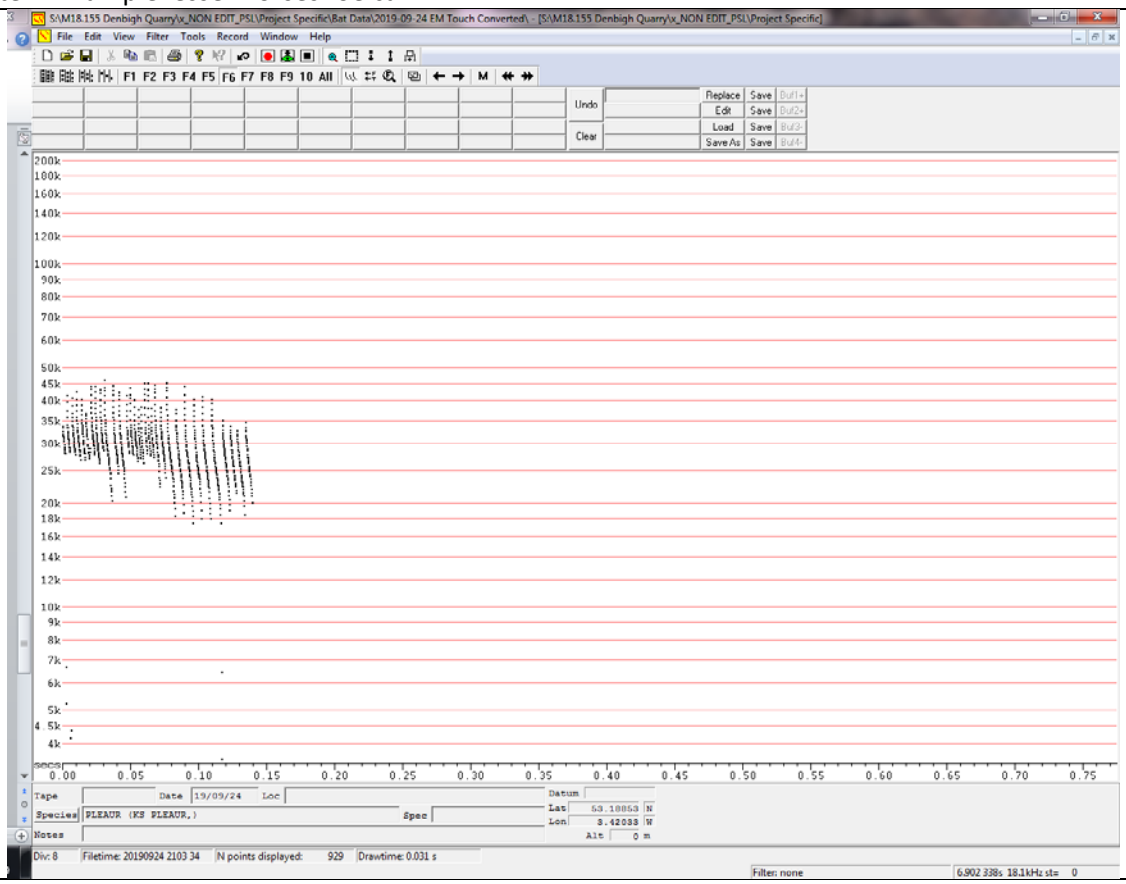

Plate 8. Example brown long-eared call