

The Keadby 3 Low Carbon Gas Power Station Project

PINS Ref: EN010114

The Keadby 3 Low-Carbon Gas Power Station Order

**Land at and in the vicinity of the Keadby Power Station site,
Trentside, Keadby, North Lincolnshire**

Preliminary Environmental Information (PEI) Report Volume II - Appendix 11E: Bat Survey Report

The Planning Act 2008

**The Infrastructure Planning (Environmental Impact Assessment)
Regulations 2017**

Applicant: SSE Generation Limited

Date: November 2020

DOCUMENT HISTORY

Document Ref			
Revision	P1.0		
Author	David Bodenham / David Broughton		
Signed		Date	November 2020
Approved By	Susan Evans / Richard Lowe		
Signed		Date	November 2020
Document Owner	AECOM		

GLOSSARY

Abbreviation	Description
CIEEM	Chartered Institute of Ecology and Environmental Management
CCGT	Combined Cycle Gas Turbine
CCP	Carbon Capture and Compression
DCO	Development Consent Order
EclA	Ecological Impact Assessment
NERC	Natural Environment and Rural Communities Act
PEA	Preliminary Ecological Appraisal
PEI Report	Preliminary Environmental Information Report

CONTENTS

1.0	Introduction	1
1.1	Background	1
1.2	Survey Scope	1
2.0	Methods	3
2.1	Desk Study	3
2.2	Bat Activity Survey	3
2.3	Nature Conservation Evaluation	5
2.4	Limitations	5
3.0	Legislation, Planning Policy and Related Guidance	7
4.0	Results	8
4.1	Desk Study	8
4.2	Bat Activity Survey	8
5.0	Conclusions	10
5.1	Summary Findings of the Surveys	10
5.2	Assessment of the Relative Geographic Importance of the Proposed PCC Site and Adjacent Land as Bat Foraging and Roosting Habitat	10
6.0	References	12
	Figure 11E.1 - Bat activity survey	13

ANNEXES

Annex A: Results of the Transect Survey	14
Annex B: Results of the Static Survey	17

TABLES

Table 1: Transect survey dates, timings and associated environmental conditions	4
Table 2: Static detector survey dates, timings and associated environmental conditions	5
Table 3: Summary of the results of the static detector surveys	9
Table 4: Assessment of the value of foraging and commuting habitats for the species recorded	11

1.0 INTRODUCTION

1.1 Background

- 1.1.1 This report accompanies **Chapter 11: Biodiversity and Nature Conservation** (PEI Report Volume I) and describes the approach and findings of the bat activity surveys undertaken in support of the Ecological Impact Assessment (EclA) of the Proposed Development.
- 1.1.2 The terms of reference used to describe the Proposed Development in this report are broadly consistent with those defined within the main chapters of the Preliminary Environmental Information (PEI) Report (Volume I) and for clarity include:
- The Proposed Development Site which encompasses an area of approximately 88.1 hectares (ha) which included 17.7ha of land currently under evaluation to determine the suitability for potential construction laydown. It is noted that not all of this land will be required and will be refined through ongoing studies and assessment prior to submission of the DCO Application;
 - The Proposed Power Station and Carbon Capture Site (Proposed PCC Site), which comprises:
 - an area of approximately 18.7ha of the Keadby Power Station site that is located within Keadby Common on which the built development associated with the combined cycle gas turbine (CCGT) and carbon capture and compression (CCP) plant is proposed with associated offices and parking; and
 - overhead electricity transmission lines associated with the existing National Grid 400kV Substation which bisect the Proposed PCC Site.

1.2 Survey Scope

- 1.2.1 An initial Preliminary Ecological Appraisal (PEA) of the ecological constraints and opportunities associated with the Proposed Development Site was made by AECOM in March 2020, including identification of the requirements for further protected species survey. The findings of the habitat and scoping survey are compiled as a PEA report (included as **Appendix 11E** in PEI Report Volume II), which should be referred to for a more detailed overview of the Proposed Development Site conditions and habitats present.
- 1.2.2 This habitat information was used to identify locations within the potential zone of influence of the Proposed Development that supported conditions potentially suitable as roosting or foraging habitat for bats. Accordingly, the PEA report (**Appendix 11E**, PEI Report Volume II) confirms that no habitats with potential to support bat roosts would be affected by the Proposed Development, so further survey and assessment was not required in relation to this. In addition, the PEA report identifies that bat activity surveys were only required of undeveloped land within and adjacent to the Proposed PCC Site, including land within the former Keadby Ash Tip being considered at that time for, but subsequently rejected as, a potential temporary laydown area. Bat activity surveys were not necessary elsewhere as there would be no impacts on habitats that would be likely to affect the suitability of these habitat for bats (based on considerations for habitat availability, quality and connectivity).

1.2.3 The purpose of the bat surveys and this report is to:

- provide data on the level, nature and location of bat activity associated with the Proposed PCC Site and immediately adjacent land with suitable habitat (excluding habitats encompassed within the boundary of the Keadby 2 Power Station construction site);
- present the above data in a manner that allows the results to be used to support an assessment of relative nature conservation value, including review against relevant criteria (see Section 2 of this report); and
- inform the options for impact avoidance, mitigation and/or compensation to be considered during design of the Proposed Development.

1.2.4 The purpose of this report is to provide baseline technical information only. It does not seek to include recommendations, specify mitigation, or make an EclA of the Proposed Development. The formal EclA is provided as **Chapter 11: Biodiversity and Nature Conservation** (PEI Report Volume I), and this riparian mammal report comprises an appendix to that chapter.

2.0 METHODS

2.1 Desk Study

- 2.1.1 A desk study was undertaken as part of the PEA (included as **Appendix 11C**, PEI Report Volume II) that was completed in advance of the bat surveys and informed the scoping of requirements for further survey.
- 2.1.2 Desk study results of relevance to the assessment have been carried forward into this report, and where appropriate this data is presented in more detail or re-interrogated for the needs of the current assessment.

2.2 Bat Activity Survey

- 2.2.1 The bat activity survey was completed in accordance with upon current good practice survey requirements (Collins, 2016) for a site that is of low suitability for foraging and commuting bat species.
- 2.2.2 The survey approach therefore involved a combination of transect survey and static detector survey, with one of each type of survey completed during each season when bats are active (spring, summer and autumn). This survey approach is described in more detail below.
- 2.2.3 Surveys were scheduled for dates when appropriate weather conditions were expected. Appropriate conditions were those with an absence of rain and/or strong wind and with evening temperatures above 7°C.

Transect Survey

- 2.2.4 The survey dates, times and associated weather conditions are detailed in Table 1. Surveyors were in position on site ready to start from just before sunset, and the surveys lasted until at least two hours after sunset, to correspond with peak activity as bats leave their roosts.
- 2.2.5 The transect route used during the survey is shown on **Figure 11E.1** (at the end of this report), and this was selected to take in as much of the undeveloped land within the Proposed PCC Site as possible (excluding habitats encompassed within the boundary of the Keadby 2 Power Station construction site), taking care to cover all habitats of potential value to foraging and commuting bats. The transect route also took in part of the adjacent former Keadby Ash Tip for the reasons given in Section 1 of this report. While this land is no longer of direct relevance to the Proposed Development, it does allow the level of bat activity recorded within the Proposed PCC Site to be compared with levels of bat activity in association with other habitats of potential foraging and commuting value to bats.
- 2.2.6 The transect route was walked at a steady speed and bat activity was detected using appropriate bat detection equipment (an Elekon Batlogger M). All bat activity detected during the survey was recorded and mapped on a suitably scaled plan. Bat call recordings made during surveys were later analysed using BatSound v4.2 to verify species identification.

Table 1: Transect survey dates, timings and associated environmental conditions

Survey Season	Date	Sunset Time	Air Temperature (°C)	Rain ¹	Wind Speed ²	Cloud Cover ³
Spring	20/05/2020	21.06	14	0	2	0
Summer	27/07/2020	21.07	15	0	3	1
Autumn	29/09/2020	18.35	12	0	1	2

¹Rain scale: 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood
²Beaufort wind force scale: 0 = No wind, 1 = Light air, smoke drifts, 2 = Light breeze, leaves rustle, 3 = Gentle breeze, small twigs move, 4 = Moderate breeze, small branches move, 5 = Fresh breeze, small trees sway, 6 = Strong breeze, large branches move, 7 = Mod Gale, whole trees in motion
³Percentage cloud cover based on: 1 = 0-20%, 2 = 21-40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%

Static Detector Survey

- 2.2.7 This survey involved the deployment of a static SM2BAT+ bat detector at the location shown on **Figure 11E.1** (at the end of this report). This location was at the edge of woodland on a potential flight route into and out of the Proposed Development Site via boundary drains. This location was also considered to be representative of the habitats most suitable for bats in association with the Proposed PCC Site.
- 2.2.8 The survey dates, times and associated weather conditions are detailed in Table 2. In each survey period, data was collected for five consecutive full nights of suitable weather.
- 2.2.9 The static detectors were set to start recording half an hour before sunset and to stop recording half an hour after sunrise. Bat calls were recorded in WAV format. All bat calls recorded by the static bat detectors were subsequently analysed using AnalookW and BatSound v4.2 software to identify the bat species recorded. The number of bat passes recorded was used to calculate a value for the level of bat activity present during the survey period. A bat pass is defined as a single static detector file made up of bat pulses of a single species, therefore a single bat pass may comprise recordings of one or more bats. It is not possible to separate the pulses out to identify the number of bats involved, so the number of bat passes recorded on static detectors cannot be reliably correlated to actual bat abundance. However, it does provide an indication of the level of bat activity at a site over a longer period of time than is recorded during bat activity transect survey.
- 2.2.10 There is no published guidance to inform interpretation of relative levels of bat using static bat detector data. For the purpose of this report, the bat activity levels recorded are classified as follows:
- Very low activity - defined as a mean of <2 passes per hour (per static location);
 - Low activity - defined as a mean of 2 to 25 passes per hour;
 - Moderate activity - defined as a mean of 26 to 99 passes per hour; and
 - High activity - defined as a mean of over 100 passes per hour.

Table 2: Static detector survey dates, timings and associated environmental conditions

Survey Season	Start Date	End Date	Maximum Temperature (°C)	Minimum Temperature (°C)
Spring	20/05/2020	25/05/2020	27.0	8.0
Summer	27/07/2020	31/07/2020	24.2	14.6
Autumn	01/10/2020	05/10/2020	14.6	3.9

2.3 Nature Conservation Evaluation

- 2.3.1 Evaluation of the relative nature conservation value of the identified ecological features within a site (encompassing nature conservation designations, ecosystems, habitat and species) is required to inform EclA. This report presents the evaluation for the bat species and assemblage recorded, and the impact assessment is presented in **Chapter 11: Biodiversity and Nature Conservation** (PEI Report Volume I).
- 2.3.2 The method of evaluation that has been utilised has been developed with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) *Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater and Coastal and Marine – Second Edition* (CIEEM, 2019). These guidelines give advice on scoping and carrying out environmental assessments and place appraisal in the context of relevant policies. Data received through consultation, desk-based studies and field-based surveys are used to allow ecological features of nature conservation value or potential value to be identified, and the main factors contributing to their value described and related to available guidance. This data can also be used to identify other relevant values e.g. socio-economic or ecosystem services values, but this is beyond the remit of this report and requires the involvement of other relevant specialists.
- 2.3.3 The value of a faunal species, such as bats, may relate, for example, to its geographic location (species may be rare and more valued towards the edge of their geographic range), the extent to which the species is threatened throughout its range, or to its rate of decline. The value of the bat species and assemblage associated with the Proposed Development Site has been defined with reference to the geographical level at which it is considered to matter (Table 3). This assessment has been made with reference to published guidance and criteria, which in this case is Wray *et al.* 2010.

2.4 Limitations

- 2.4.1 There was only one survey limitation that affected the survey work completed. This involved a drop in the overnight temperature on 1st October 2020 to below 7°C for a period of 4 hours during the five nights of autumn static bat detector survey. Temperatures below 7°C are considered sub-optimal for bat survey.
- 2.4.2 This limitation, given the brief period of relevance and the results for the bat activity survey as a whole, has not adversely affected provision of a robust assessment of the importance of the Proposed Development Site for bats.

- 2.4.3 The only limitation to the survey data analysis is one common to all bat surveys and assessments. This relates to the inability to reliably separate species of *Myotis* bat through call analysis. Consequently, it is normally the case that the relevant survey results have to be reported as an unidentified *Myotis* bat species. In this case, the habitats associated with the Proposed Development Site, as described in **Appendix 11C** (PEI Report Volume II), mean that the only plausible (reasonably likely) species of *Myotis* bat is the Daubenton's bat (*Myotis daubentonii*). This is a species commonly encountered in association with open freshwater habitats, such as the extensive network of rivers, canals and drains in the vicinity of the Proposed Development Site. Other species of *Myotis* bat are more likely to be encountered in landscapes with extensive woodland and/or other good quality semi-natural habitats, rather than intensively managed arable landscapes such the one within which the Proposed Development Site is located.

3.0 LEGISLATION, PLANNING POLICY AND RELATED GUIDANCE

- 3.1.1 The following wildlife legislation, planning policy and guidance is specifically relevant to the identification and assessment of potential constraints posed by the presence of bats. At this stage of assessment, this legislation, policy and guidance is primarily listed to demonstrate that an appropriate level of survey and assessment has been undertaken to meet likely data requirements for future decision-making regarding these material considerations.
- 3.1.2 Wider relevant biodiversity legislation, policy and guidance is detailed in **Appendix 11A: Biodiversity and Nature Conservation Legislation and Planning Policy** (PEI Report Volume II).
- 3.1.3 Bat species are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). The relevant aspects of this legislation, when taken together, results in a level of protection that prohibits the intentional, deliberate or reckless:
- killing, injuring, taking or disturbance of bats; and
 - damaging, destroying or obstructing any place used by bats for the purposes of breeding, sheltering or protection.
- 3.1.4 Certain bat species are also listed as 'Species of Principal Importance for Nature Conservation in England' pursuant to Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act requires that local planning authorities have regard to the conservation of biodiversity in England, when carrying out their normal functions.
- 3.1.5 The Government has published standing advice (Natural England and Department of Environment, Food and Rural Affairs (Defra), 2020) to guide decision-makers on the determination of proposals with potential to affect protected species such as bats. The guidance sets out responsibilities and minimum requirements for survey and mitigation.

4.0 RESULTS

4.1 Desk Study

- 4.1.1 The desk study returned records of common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle (*P. pygmaeus*) bats within 1km of the Proposed Development Site, but most these records are located more than 1km from the Proposed PCC Site.
- 4.1.2 One of the desk study records is located in the 1km grid square TL8212, which covers part of the Proposed PCC Site and land to the north. This is a 2003 record of a common pipistrelle roost, located at North Moor Farm, 0.7km to the north-east of the Proposed PCC Site. All of the other bat records (considering only those that were provided with adequate grid references) were made to the south-west of the Proposed PCC Site, with the closest at Althorpe approximately 1.4km from the Proposed PCC Site.
- 4.1.3 Surveys within the boundary of Keadby Wind Farm have recorded low levels of common pipistrelle (*Pipistrellus pipistrellus*) activity in association with farmland to the north and south of the Proposed Development Site (Jacobs, 2016).
- 4.1.4 In 2017, AECOM undertook surveys for the Applicant (unpublished data) within the area of the former Keadby Ash Tip covered by the current survey but excluding the Proposed PCC Site. This survey collected data in May, July and August coinciding with spring, mid-summer and late summer (an autumn survey was not possible). The survey recorded low levels of bat activity (as defined above in Section 2.2). This activity predominantly involved low levels of activity by common pipistrelle bat. Very low to low levels of activity by an unidentified *Myotis* bat(s) was recorded during all surveys. In addition, very low levels of activity by soprano pipistrelle were recorded in May and August 2017, and very low levels of activity by noctule (*Nyctalus noctula*) and Leisler's bat in August 2017.

4.2 Bat Activity Survey

Transect Survey

- 4.2.1 The summary results of the transect surveys are shown by season on **Figure 11E.1** (at the end of this report), with the raw survey data are provided as **Annex A**.
- 4.2.2 Two bat species were recorded during the transect surveys, with the majority of records during all three survey visits relating to common pipistrelle.
- 4.2.3 The common pipistrelle activity involved small numbers of bats (typically only one or two bats), with this activity recorded in areas of dense scrub and secondary woodland habitats on the western boundary of the Proposed PCC Site and within the former Keadby Ash Tip adjacent to the Proposed PCC Site. No common pipistrelle activity was recorded within the Proposed PCC Site.
- 4.2.4 A small number of passes by noctule bats were recorded in spring and autumn. These bats were not seen, so are presumed to have been flying high over the survey area. This is supported by the brief nature of the bat calls recorded.

Static Detector Survey

- 4.2.5 The static survey results are provided in Table 3, which summarises the bat activity (passes) and the associated level of bat activity (as defined in Section 2.2) for each survey period. The raw survey data are provided as **Annex B**.
- 4.2.6 At least three bat species were recorded over the three static detector surveys, all of which showed only very low levels of activity (as defined above in Section 2.2). These species were common pipistrelle, soprano pipistrelle and an unidentified *Myotis* bat species. In this case, it is considered that the unidentified *Myotis* bat can be assumed to be Daubenton’s bat (see Section 2.4), this being the only plausible given the habitat conditions and landscape associated with the Proposed PCC Site (see limitation, Section 2.4).
- 4.2.7 The static survey results are consistent with the findings of the walked transect surveys in that most of the recorded bat activity related to common pipistrelle. However, two additional species were recorded. One pass of a soprano pipistrelle was recorded in spring, and the assumed Daubenton’s bat was present in spring and autumn.

Table 3: Summary of the results of the static detector surveys

Survey Season	No. nights of data	Total bat passes for recording period			Mean passes per hour (all species)	Bat activity level
		Common pipistrelle	Soprano pipistrelle	<i>Myotis</i> species		
Spring	5	34	1	2	1	Very low
Summer	5	19	0	0	0.5	Very low
Autumn	5	23	0	3	0.5	Very low

5.0 CONCLUSIONS

5.1 Summary Findings of the Surveys

- 5.1.1 The combined results of the bat activity demonstrate only a very low level of bat activity by four bat species in association with the boundaries of the Proposed PCC Site and an adjacent area of the former Keadby Ash Tip. No bat activity was recorded from within the main body of the Proposed PCC Site. This level of bat activity and the species recorded is consistent with the unpublished findings of a previous bat survey of Keadby Ash Tip completed by AECOM in 2017 (see desk study, Section 4.1).
- 5.1.2 The only bat species recorded consistently during all survey visits and survey methods was common pipistrelle, which used the boundaries of the Proposed PCC Site to forage and commute through to access other habitats.
- 5.1.3 Habitat usage by the noctule bat was not observed, and it may have foraged in the air space over the Proposed PCC Site, but it is considered that more optimal and attractive foraging conditions for this species are present in association with adjacent land supporting more established semi-natural vegetation e.g. the former Keadby Ash Tip.
- 5.1.4 Other species, soprano pipistrelle and assumed Daubenton's bat, were recorded only sporadically and at very low levels through static detector survey. Given the location of the static detector this activity was associated with habitats on the boundary of the Proposed PCC Site, and there is no evidence to indicate use of land within the main body of the Proposed PCC Site. While this is possible, again it is considered that the habitats of highest foraging and commuting quality for these species are located on adjacent land.
- 5.1.5 The four bat species recorded are considered typical for the geographic location of the Proposed Development and the habitats present. None of the species recorded (and regardless of whether the *Myotis* species involved is Daubenton's bat or another species) are currently considered threatened within England or Great Britain (The Mammal Society, 2020). These four species are also not considered to be rare in Lincolnshire (Greater Lincolnshire Nature Partnership, 2013).
- 5.1.6 Given the limited number of common bat species recorded and that these are typical for the habitats present, the combined bat assemblage is not considered particularly notable. The number of bat species recorded is well below what might typically be expected in parts of Lincolnshire and other lowland areas of England where habitat conditions are more optimal for bats.

5.2 Assessment of the Relative Geographic Importance of the Proposed PCC Site and Adjacent Land as Bat Foraging and Roosting Habitat

- 5.2.1 The transect and static survey data has been considered together to assess the relative geographic importance (nature conservation value) of the Proposed Development Site for bats based on the methods and scoring system described in Wray *et al.* (2010), supplemented (if appropriate) by professional judgement and consideration of available information on the current status of the bat species concerned.
- 5.2.2 The results of this assessment are provided below as Table 4. Based on this assessment, the Proposed PCC Site and immediately adjacent land is considered to

be of between local and district geographic importance as foraging habitat and commuting habitat for the four bat species recorded.

5.2.3 All four of the identified species, all of which are of relatively favourable nature conservation status nationally and in Lincolnshire, make only limited use of the Proposed PCC Site and adjacent land within the former Keadby Ash Tip. There is no evidence that the survey area provides either functionally important foraging habitat, or otherwise provides important habitat connections (commuting habitat) for bats moving between roosts and preferred feeding areas. This is not surprising given the most optimal habitats for bats (the former Keadby Ash Tip) is essentially an island of habitat isolated within an extensive open landscape that is managed intensively for arable production. Habitat features optimal for use by bats to navigate across the landscape are also very limited, being restricted to the network of drains that subdivide arable fields. Other habitats connections such as hedgerows and cohesive areas of woodland are absent. There are no habitats likely to be of high attractant value to bats within the Proposed PCC Site. Instead, the most suitable habitats are on the boundaries of the Proposed PCC Site and adjacent land.

5.2.4 Given this additional context, the geographic importance of the Proposed PCC Site and adjacent land is revised to local value based on professional judgement.

Table 4: Assessment of the value of foraging and commuting habitats for the species recorded

Species	Relative rarity in UK ¹	Number of bats	Roosts/potential roosts nearby ²	Type and complexity of linear features	Commuting value	Character of foraging habitat	Foraging value
Common pipistrelle	Common	Small numbers	Small number	Site isolated in arable landscape with large field sizes. Habitat connectivity across/ around Proposed PCC Site poor (minor field drains only).	Local to district	Isolated woodland patches, less intensive arable and/or small towns and villages.	Local to district
Soprano pipistrelle	Common	Individuals	Small number	As above	Local to district	As above	Local to district
Noctule bat	Rarer	Individuals	None (open landscape lacking mature trees)	As above.	Local to district	As above	Local to district
<i>Myotis</i> (assume Daubenton's bat)	Common	Individuals	Small number	As above (major waterbodies bypass the Proposed PCC Site).	Local to district	As above (major waterbodies bypass the Proposed PCC Site).	Local to district

¹This is based on minimum estimated population size with the most current reference for this, superseding the references cited in Wray *et al.* (2010), being Mathews *et al.* (2018).

²Recorded or potential based on desk study and field survey data (including consideration of habitat suitability as described in **Appendix 11C** (PEI Report Volume II)).

6.0 REFERENCES

CIEEM (2019) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.

Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edition.). Bat Conservation Trust, London.

Greater Lincolnshire Nature Partnership (2013) *Bats: An Assessment of Current Status in Greater Lincolnshire*. Available online from: <https://glnp.org.uk/images/uploads/news/status-of-bats-in-lincolnshire-march-2013.pdf> [accessed October 2020]

Jacobs (2016) *Keadby Wind Farm. Conservation Management Plan – Year 1 Monitoring*. Unpublished report to SSE Renewables.

Mathews, F., Kubasiewicz, L.M., Gurnell, J., Harrower, C.A., McDonald, R.A. & Shore, R.F. (2018) *A Review of the Population and Conservation Status of British Mammals*. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough. Available online from: <http://publications.naturalengland.org.uk/publication/5636785878597632> [accessed October 2020]

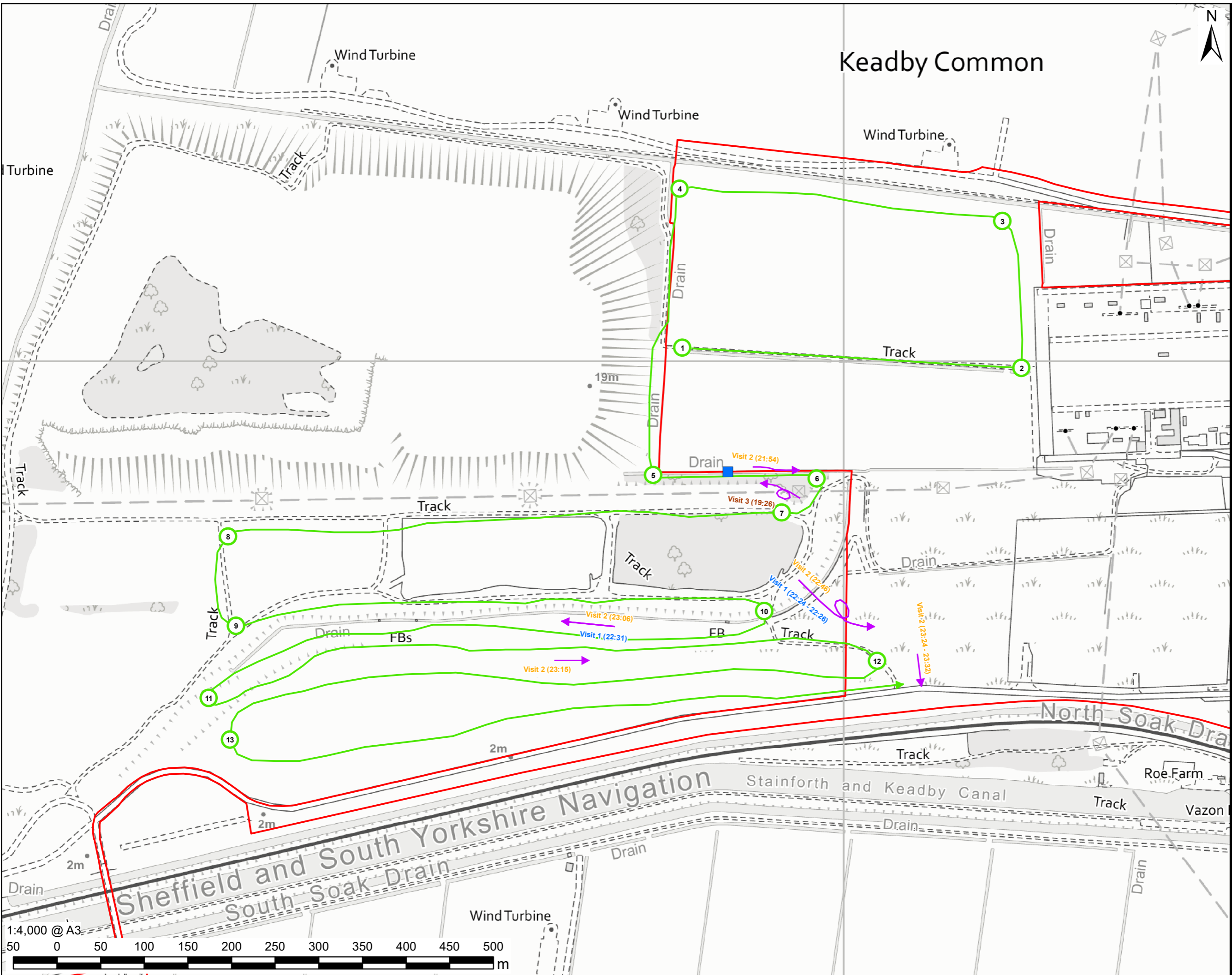
Natural England and Defra (2020) *Bats: surveys and mitigation for development projects*. Available online from: <https://www.gov.uk/guidance/bats-surveys-and-mitigation-for-development-projects#history> [accessed October 2020]

The Mammal Society (2020) Red List for Britain's Mammals. Available online from: <https://www.mammal.org.uk/science-research/red-list/> [accessed October 2020]

Wray. S., Wells. D., Long. E. and Mitchell-Jones. T. (2010) Valuing bats in ecological impact assessment. *In Practice* 70.

FIGURE 11E.1 - BAT ACTIVITY SURVEY

Filename: C:\Users\Ben.O'Neill\OneDrive - AECOM\Documents\Local02 SSE Keadby\07 CAD & GIS\02_Maps\PEA Preliminary Environmental Assessment\Ecology\K_PEA_Fig_11E.1_Bat_Activity_Survey_A3_20201109_R01.mxd
 Revision: 01 Drawn: BO Checked: JW Approved: GS Date: 10/11/2020



PROJECT
 Keadby 3 Low-Carbon Gas Power Station Project
 Preliminary Environmental Information Report
CLIENT
 SSE Generation Limited

CONSULTANT
 AECOM Limited
 Midpoint
 Alencon Link
 Basingstoke, RG21 7PP
 T: +44-(0)20-7061-7000
 www.aecom.com

LEGEND

- Proposed Development Site
- Common pipistrelle Flight Line
- Transect Route
- Stop Location
- Static Detector

Blue text refers to 'Visit 1 (Spring)'
 Orange text refers to 'Visit 2 (Summer)'
 Brown text refers to 'Visit 3 (Autumn)'

NOTES
 Reproduced from Ordnance Survey digital map data © Crown copyright 2020. All rights reserved. Licence number 0100031673.

ISSUE PURPOSE
 BAT ACTIVITY SURVEY REPORT
PROJECT NUMBER
 60625943
SHEET TITLE
 Bat Activity Survey

SHEET NUMBER
 Figure 11E.1

The drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.

ANNEX A: RESULTS OF THE TRANSECT SURVEY

Table A1: May Bat Activity Transect Results

Date: 24/05/20		Temperature (°C): 14		Rain (0-5) ² : 0
Sunset time: 21.06		Wind (0-7) ³ : 2		Cloud Cover (0-5) ⁴ : 0
Start Time: 21:00	Finish Time: 23:10	Equipment used: Elekon Batlogger M		Weather description (incl. previous evening): Dry, warm (at survey and previous)
Reference Number/Stop	Time	Species ¹	No. of bats	Activity/Description
7	22:10	NYNO	1	Heard not seen (HNS), 2 passes
8	22:24-22:26	PIPI	1	Foraging in depression
8-9	22:31	PIPI	1	Commuting west along scrub line
8-9	22:42	PIPI	1	HNS
8-9	22:49	PIPI	1	HNS
8-9	22:53	PIPI	1	HNS
9-10	23:00	NYNO	1	HNS
9-10	23:01	PIPI	1	HNS
<p>¹Species codes: PIPI: common pipistrelle (<i>Pipistrellus pipistrellus</i>), NYNO: noctule (<i>Nyctalus noctula</i>)</p> <p>²Rain scale: 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood</p> <p>³Beaufort wind force scale: 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion</p> <p>⁴Percentage scale based on: 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%</p>				

Table A2: July Bat Activity Transect Results

Date: 27/07/20		Temperature (°C): 15		Rain (0-5)²: 0
Sunset time: 21:07		Wind (0-7)³: 1		Cloud Cover (0-5)⁴: 1
Start Time: 21:07	Finish Time: 23:35	Equipment used: Elekon Batlogger M		Weather description (incl. previous evening): Humid, thunderstorm just before survey
Reference Number/Stop	Time	Species¹	No. of bats	Activity/Description
5	21:54	PIPI	1	Commuting along woodland edge
5	21:59	PIPI	1	Commuting along woodland edge
8	22:46-22:49	PIPI	1	Foraging in depression
9-10	23:06	PIPI	1	HNS
10-11	21:15	PIPI	1	HNS
12	23:29-23.32	PIPI	1	HNS
<p>¹Species codes: PIPI: common pipistrelle (<i>Pipistrellus pipistrellus</i>)</p> <p>²Rain scale: 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood</p> <p>³Beaufort wind force scale: 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion</p> <p>⁴Percentage scale based on: 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%</p>				

Table A3 September Bat Activity Transect Results

Date: 29/09/2020		Temperature (°C): 12		Rain (0-5)²: 0
Sunset time: 18:45		Wind (0-7)³: 1		Cloud Cover (0-5)⁴: 2
Start Time: 18.45	Finish Time: 20:45	Equipment used: Elekon Batlogger M		Weather description (incl. previous evening): Cool, calm and dry. Previous evening dry
Reference Number/Stop	Time	Species¹	No. of bats	Activity/Description
5	19:14	PIPI	1	Commuting along hedgerow west
5	19:17	PIPI	1	Commuting along hedgerow west
6	19.21	PIPI	1	HNS
7	19:26	PIPI	1	Foraging beneath pylon
9	19:42	PIPI	1	HNS
9	19:43	PIPI	1	HNS
10-11	19:59	PIPI	1	HNS
11	20:05	PIPI	1	HNS
12	20:17	NYNO	1	HNS
<p>¹Species codes: PIPI: common pipistrelle (<i>Pipistrellus pipistrellus</i>) NYNO: noctule (<i>Nyctalus noctula</i>)</p> <p>²Rain scale: 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood</p> <p>³Beaufort wind force scale: 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion</p> <p>⁴Percentage scale based on: 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%</p>				

ANNEX B: RESULTS OF THE STATIC SURVEY

Table B1: Spring Static Survey Results

Night	Date	Sunset	Sunrise	Average hours of darkness	Total no. bats	Species and number of bats			Bat Activity Index	
						Common pipistrelle	Soprano pipistrelle	<i>Myotis sp.</i>		
1	19/05/2020	21:05	04:54	7.8	12	12	0	0	1.5	
2	20/05/2020	21:06	04:52	7.8	8	7	1	0	1.0	
3	21/05/2020	21:08	04:51	7.7	10	9	0	1	1.3	
4	22/05/2020	21:09	04:49	7.7	6	6	0	0	0.8	
5	23/05/2020	21:11	04:48	7.6	1	0	0	1	0.1	
					Total	34	1	2	Mean Activity Index	1.0

Table B2: Summer Static Survey Results

Night	Date	Sunset	Sunrise	Average hours of darkness	Total no. bats	Species and number of bats		Bat Activity Index	
						Common pipistrelle			
1	27/07/2020	21:07	05:13	7.1	1	1		0.1	
2	28/07/2020	21:05	05:15	7.1	0	0		0.0	
3	29/07/2020	21:03	05:16	7.2	7	7		1.0	
4	30/07/2020	21:02	05:18	7.2	4	4		0.6	
5	31/07/2020	21:00	05:19	7.3	7	7		1.0	
					Total	19		Mean Activity Index	0.5

Table B3: Autumn Static Survey Results

Night	Date	Sunset	Sunrise	Average hours of darkness	Total no. bats	Species and number of bats		Bat Activity Index	
						Common pipistrelle	<i>Myotis sp.</i>		
1	01/10/2020	18:38	07:06	11.5	5	5	0	0.4	
2	02/10/2020	18:35	07:08	11.5	11	9	2	1.0	
3	03/10/2020	18:33	07:10	11.6	3	3	0	0.3	
4	04/10/2020	18:30	07:11	11.6	4	4	0	0.3	
5	05/10/2020	18:28	07:13	11.7	3	2	1	0.3	
					Total	23	3	Mean Activity Index	0.5