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**By Email:  
26<sup>th</sup> October 2020**

**Job Ref: J20563\_P5\_Reading SGN Gas Holder Site\_uPEA**

Dear Mr Robson,

**Site – Reading SGN Gas Holder No. 4, Kenavon Drive, Reading, Berkshire, RG1 3DH**

In response to proposed development of the Reading SGN Gas Holder Site no. 4, an updated Preliminary Ecological Appraisal (PEA) assessment was undertaken by Greenspace Ecological Solutions (GES) on 20th October 2020.

Henceforth referred to as ‘the Site’, development proposals are understood to involve the redevelopment of the existing contaminated brownfield site into a new residential development with associated parking and landscaping. For clarity, photographs of the Site are provided in Appendix A.

Please note, as the information below is provided as an update only, for clarity this letter should be read in conjunction with the following associated reports:

- PEA (J20563\_Rev C; GES, 2019) (Appendix B);
- Bat Emergence Survey Report (J20563\_P2; GES, 2019) (Appendix C); and
- Bat Roost & Bat Activity Survey Report (J20563\_P2\_Rev A; GES, 2019) (Appendix D).

### **Introduction**

Due to time elapsed since the previous ecological surveys, the land to be impacted by the proposed development has been subject to an update PEA.

The update Site assessment was undertaken on 20th October 2020 by suitably experienced ecologist Matthew Rohner of GES. The findings of the survey serve to determine if the Site and surrounds have undergone any significant change regarding their suitability to support protected habitats/species since the previous ecological surveys.

### **Site Location**

The Site is located on the eastern periphery of the town of Reading, Berkshire, at National Grid reference: SU 728 736. The Site occupies approximately 0.71ha and comprises of areas of scrub, scattered trees, and buildings within areas of hard standing. A prominent gas holder is present within the Site.

The Site is bound by residential dwellings to the east, the River Kennett to the south and east, and a railway line to the north. The wider landscape is one of industrial units to the east and west, with pockets of scrubland to the north, beyond the railway.

### **Survey Methodology**

Habitats were surveyed using the PEA methodology outlined in 'The Handbook for Phase I Habitat Survey: A Technique for Environmental Audit' (JNCC, 2010). Any changes to the habitats since the previous surveys were noted. The Phase I Habitat Survey was extended to include an assessment of the Site's potential to support protected and notable species., comprising assessment of the suitability of the habitats present within the Site to support these species, as well as connectivity to the Site from other areas of potentially suitable habitat nearby.

### **Survey Constraints**

PEA can be undertaken at any time of the year however, the optimum time of year for these surveys to be undertaken is between April and September (inclusive) to enable the majority of botanical species to be detected. As this survey was undertaken outside of this optimum period, there is a possibility that some annual species may not have been recorded. Mapping and description of broad habitat types has however, still been possible.

### **Results**

#### *Phase I Habitat Survey*

The habitat types and their suitability to support protected species remain broadly the same as was found during the previous surveys (GES, 2019). The results of the aforementioned surveys, therefore, remain valid with the following exceptions:

1. Scattered scrub is encroaching onto the Site along the northern and western boundaries. These areas comprise predominantly pioneer species, such as willowherbs *Epilobium* spp., with negligible potential to support protected or notable species.
2. A small rubble pile is present adjacent to the eastern Site boundary.
3. A small pile of vegetation waste is present adjacent to the aforementioned rubble pile.

### **Conclusions and Recommendations**

With no significant change to the status of the Site, the conclusions and recommendations set out within the previous appended reports (GES, 2019a, b and c) remain current and valid.

The rubble and vegetation piles have the potential to provide sheltering opportunities for amphibians and reptiles. It is recommended that these piles be removed by hand during the active season for herpetofauna of March – October. In the unlikely event that a protected species is identified during removal, works to these areas of the Site should **stop** and the appointed ecologist is to be contacted to advise on the manner in which to proceed.

I trust that you find the above information of use, but if you have any questions or queries please do not hesitate to contact us.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'M. Rohner', with a stylized flourish at the end.

Matthew Rohner MSc Grad CIEEM  
Ecologist

## REFERENCES

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

Greenspace Ecological Solutions. (2019a). *J20563\_Rev C\_Gas Holder Site: Preliminary Ecological Appraisal Report*. Unpublished.

Greenspace Ecological Solutions (2019b). *J20563\_P2\_Rev C\_Gas Holder Site: Bat Emergence Survey Report*. Unpublished.

Greenspace Ecological Solutions (2019c). *J20563\_P4\_Bat Roost and Bat Activity Survey Report*. Unpublished.

JNCC. (2010). *Handbook for Phase I Habitat Survey; A Technique for Environmental Audit*. Peterborough.

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 [online]. Available at: <https://www.legislation.gov.uk/uksi/2019/579/regulation/35/made>

Natural Environment and Rural Communities (NERC) Act 2006 [online]. Available at: <http://www.legislation.gov.uk/ukpga/2006/16/contents>

Wildlife and Countryside Act (as amended) 1981 [online]. Available at: <http://jncc.defra.gov.uk/page-1377>

## APPENDIX A – PHOTOGRAPHS



Plate 1. Rubble pile.



Plate 2. Vegetation pile.

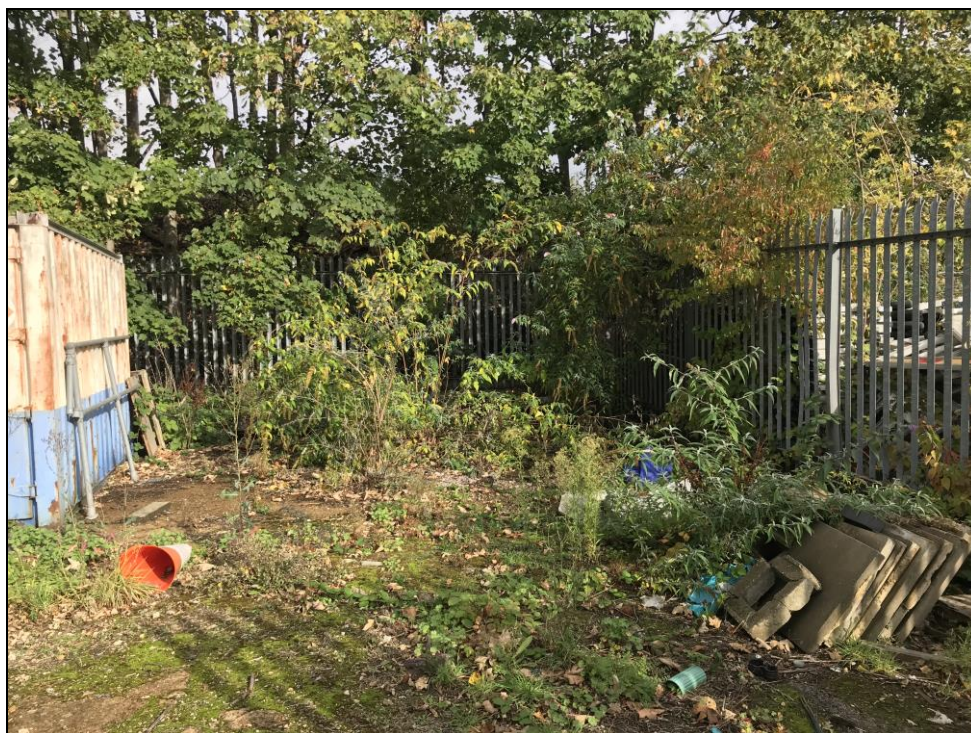


Plate 3. Scattered scrub along the northern Site boundary.



Plate 4. Scattered scrub along the north-eastern Site boundary.

## Appendix B

# Gas Holder Site, Reading

Preliminary Ecological Appraisal

April 2019



# Gas Holder Site, Reading

Preliminary Ecological Appraisal

A Report for Danescroft (Kenavon Drive  
Project Management) LLP

April 2019



**Greenspace  
Ecological  
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# Gas Holder Site, Reading

## Preliminary Ecological Assessment

April 2019

Controlled Copy

01 of 02

01 Danescroft (Kenavon Drive Project Management) LLP

02 Greenspace Ecological Solutions Ltd

This report was written by Tanya Rowlinson and proof read by James Johnston

*The content of this report is the responsibility of Greenspace Ecological Solutions Ltd.  
It should be noted that whilst every effort has been made to meet the client's requirements, no site survey can ensure complete assessment or prediction of the changeable onsite environment. Furthermore, should more than 12 months elapse between the date of this survey and any subsequent development, it may be necessary to consider the need for an update survey to be undertaken.*

Report Number J20563\_Rev B

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## FIGURES

Figure 1 Phase I Habitat Plan

## APPENDICES

Appendix A Site Photographs

Appendix B Categories of Bat Roost Potential

Appendix C Minimum Number of Surveys Required in Most Instances

## 1 PROJECT OVERVIEW

Client: Danescroft (Kenavon Drive Project Management) LLP

Site Address: SGN Gasholder No 4, Kenavon Drive, Reading, RG1 3DH.

Attending Ecologists: James Johnston

Survey Date: 04<sup>th</sup> July 2018

Site Proposals: Redevelopment of an existing contaminated brownfield site and new residential development with associated parking.

Associated Planning Reference Number: Not yet Submitted

Source of Relevant Documents:

| Document:           | Source:                                                            |
|---------------------|--------------------------------------------------------------------|
| Site Location Plan: | Google Earth Pro                                                   |
| Desk Study:         | Thames Valley Environmental Records Centre (TVERC)<br>Magic.gov.uk |
| Site Plans:         | Collado Collins Architects                                         |

## 2 INTRODUCTION

### 2.1 Context

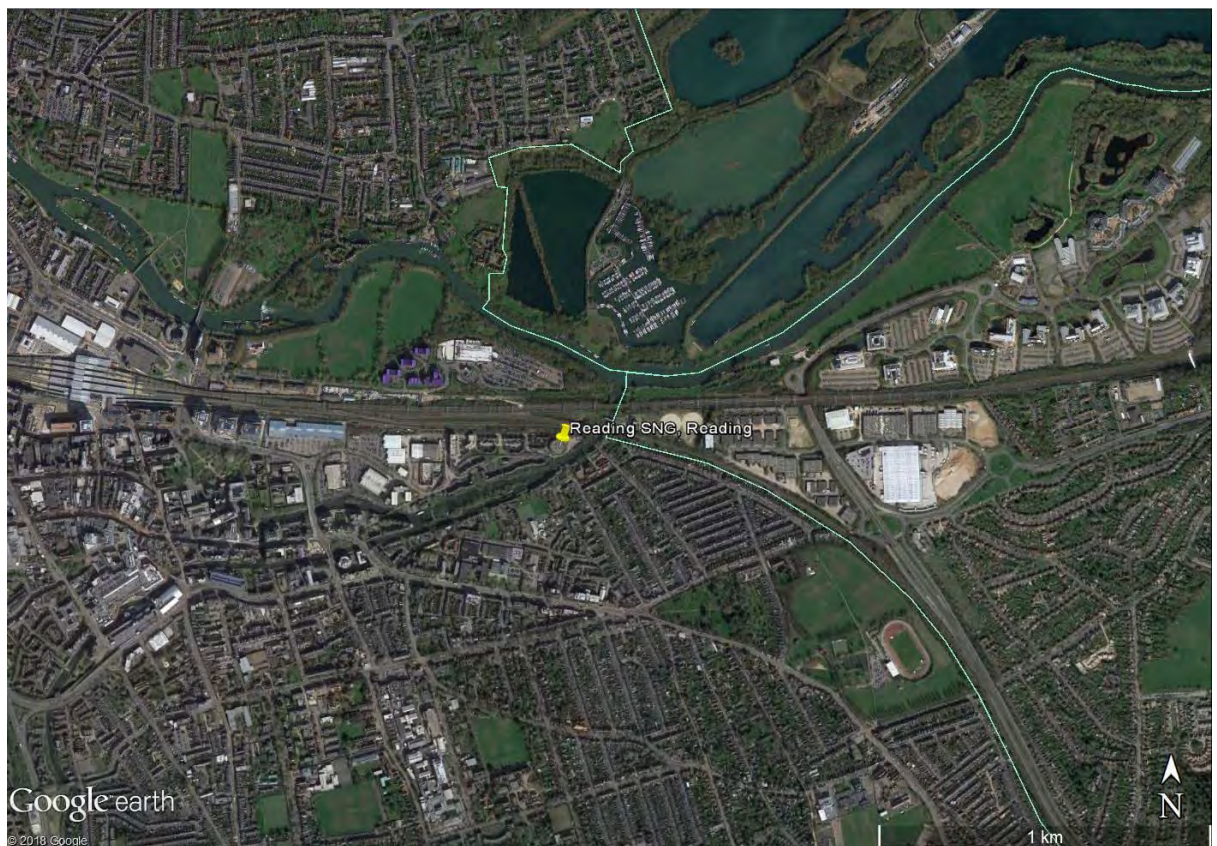
2.1.1 To inform the associated planning application, Greenspace Ecological Solutions has been commissioned by Danescroft (Kenavon Drive Project Management) LLP to undertake an Preliminary Ecological Appraisal (PEA) of the Gas Holder Site, Alexander Turner Close, Reading.

2.1.2 Henceforth referred to as ‘the site’, proposals involve the redevelopment of an existing contaminated brownfield site and new residential development with associated parking.

2.1.3 The site’s potential to support protected species and habitats has been assessed and appropriate recommendations have been provided. Trees and buildings likely to be affected have been assessed for their potential to support roosting bats. Ecological features of interest are depicted in Figure 1.

### 2.2 Site Location

2.2.1 The site is located on the eastern edge of the town of Reading, Berkshire, at National Grid Reference SU 728 736. The location of the site is depicted in Image 1.



*Image 1 – Site Location of Gas Holder Site at Alexander Turner Close, Reading*

## 2.3 Site Description

- 2.3.1 The site occupies approximately 0.71ha and comprises of areas of scrub, scattered trees and buildings within areas of hard standing. A prominent gas holder can be found within the site.
- 2.3.2 The site is bound by residential dwellings to the east; the River Kennett to the south and east; and the National railway to the north. The wider landscape is one of industrial units to the east and west and pockets of scrubland to the north, beyond the railway.

## 2.4 Legislation and Policies

### *National Planning Policy Framework*

- 2.4.1 The main legislation that applies to ecological issues within England and Wales are:
- The Conservation of Habitat and Species Regulations 2010 transposes European Union Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law. These regulations provide for the designation and protection of 'European Sites', the protection of 'European Protected Species' and the adaptation of planning controls for the protection of such sites and species. Under the regulations, public bodies have a duty in exercising their functions to have regard to the EC Habitats Directive.
  - The Wildlife and Countryside Act 1981 (as amended) provides detail on a range of protection and offences relating to wild birds, other animals, and plants. The level of protection depends on which Schedule of the Act the species is listed on. Licences are available for specific purposes to permit actions that would otherwise constitute an offence in relation to species.
  - The Natural Environment and Rural Communities (NERC) Act 2006 imposes an obligation on all public bodies, including local authorities, to consider whether their activities can contribute to the protection of wildlife. The duty is created by section 40(1) of the Act, which states that: "Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity."
  - Hedgerows Regulations Act 1997 serves to; enforce under the Environment Act 1995, restrict the removal of hedgerows, or parts of hedgerows which are over 20m in length. In this case, removal includes digging up and replanting elsewhere, as well as removing

from the land completely or destroying in the course of other actions. This includes developments or activities which destroy the roots, causing the vegetation to die.

- The Protection of Badgers Act 1992 exists for welfare reasons, to protect badgers (*Meles meles*) from cruelty. Under the act it is a criminal offence to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so, or to intentionally or recklessly interfere with a sett.

2.4.2 The above summary serves as guidance only – the reader is referred to the original legislation for definitive interpretation.

#### *UK Planning Policy*

2.4.3 The recommendations of this report are in line with the key principles of the National Planning Policy Framework (ref. 1) and Government Circular 06/05 (ref. 2).

2.4.4 Local planning policies relating to ecology are invariably based on the conservation of species protected under the above legislation, including species and habitats of principal importance listed under Section 41 of the NERC Act 2006; and the protection of designated sites. All of these features are considered within the scope of this preliminary ecological appraisal and therefore any recommendations made herein are likely to be in line with this policy.

## **2.5 Objectives of the Survey**

2.5.1 The objectives of the survey were to:

- Classify the main habitats present within the site;
- Evaluate the ecological importance of these habitats;
- Assess buildings and trees for their potential to support roosting bats;
- Evaluate the potential for other protected species to occur within the site; and
- Provide appropriate recommendations for further surveys and mitigation where required.

## **2.6 Survey Constraints**

2.6.1 Access to the interior of buildings B1 and B2 was not possible and these structures were assessed from the exterior only.

2.6.2 All measurements and indications of area given within this report are approximate.

### 3 SURVEY METHODOLOGY

#### 3.1 Desk Study

3.1.1 A desk study was undertaken to determine the presence of sites and habitats of conservation importance together with historical records of protected and notable species within a 2km radius of the site.

3.1.2 The following bodies were consulted for the desk study:

- Magic.gov.org
- Thames Valley Environmental Records Centre (TVERC)

#### 3.2 Preliminary Ecological Appraisal

##### *Habitats*

3.2.1 The site was surveyed using the methodology outlined in 'The Handbook for Phase I Habitat Survey: A Technique for Environmental Audit' (JNCC, 2010). This involves identifying the main plant communities present on the site and classifying the habitat types following the JNCC methodology. This technique provides an inventory of the basic habitat types present and enables areas of greater botanical interest which may require further, more detailed, surveys to be identified. Any occurrences of recognised invasive species as listed on Schedule 9 of the Wildlife and Countryside Act (as amended) were also noted.

3.2.2 A map of the habitats and areas of interest (using a variation of the JNCC 2010 protocol for Phase I Habitat plans) is provided in Figure 1. Photographs of features of interest are presented in Appendix A.

##### *Protected Species*

3.2.3 The Phase I Habitat Survey was extended to include an assessment of the site's potential to support protected and notable species. This involved assessing the suitability of the habitats present on the site for these species as well as connectivity to the site from other areas of potentially suitable habitat nearby.

##### *Badger*

3.2.4 Evidence of badger activity on site (and where possible within the distance generally considered to be the zone of disturbance) was assessed by searching for signs such as:

- Presence of setts, indicated by suitably sized holes or burrows
- Evidence of badger latrines, badger hair and/or footprints
- Evidence of well-used runs supported by secondary evidence such as foraging signs

*Bats*

- 3.2.5 Specific survey work was undertaken on the buildings and trees to assess their suitability to support roosting bats. In this instance, a high-powered torch was used to search for any bat roosting features.
- 3.2.6 The results of a scoping survey enable the buildings and trees to be categorised as having Confirmed, High, Moderate, Low or Negligible potential to support roosting bats. An outline of categorisation procedure for classifying bat potential is presented in Appendix B.
- 3.2.7 In accordance with current best practice guidance (Collins, 2016), the level of potential determines the need or not for further summer emergence surveys. Although left to the discretion of the appointed ecologist, in most instances High potential requires three, Moderate potential requires two and Low potential requires one evening emergence or pre-dawn re-entry survey/s (although trees with Low potential do not require further emergence or pre-dawn re-entry surveys). Greater detail on the minimum number of surveys recommended in most instances is presented in Appendix C.

*Birds*

- 3.2.8 The site was assessed for its potential to support nesting and breeding birds. Factors considered include suitable cover and feeding habitat, the presence of used and disused nests and birds displaying nesting characteristics.

*Dormouse*

- 3.2.9 The site was surveyed for suitable dormouse habitat, such as the presence of a well-connected understorey broadleaf habitat, hedgerows and suitable food sources such as oak, hazel and other nut-bearing trees, fruiting trees and shrubs, flowers and invertebrates.

*Great Crested Newt*

- 3.2.10 No waterbodies were identified within 250m of the site during the desk study. Therefore, no further reference to great crested newts is included within this report.

*Reptiles*

- 3.2.11 The site was assessed for its potential to support reptile populations. Suitable habitat for reptiles includes long grass, scrub, woodland and hedgerow borders and wood/rubble piles that act as hibernacula.

*Other species*

- 3.2.12 Consideration was given to the site's suitability to support other protected and notable species.

## 4 SURVEY RESULTS

### 4.1 Desk Study

#### *Designated Sites*

- 4.1.1 There are no statutory designated sites within 2km of the site.

#### *Non-statutory Designated Sites*

- 4.1.2 Non-statutory designated sites within 2km of the site are provided below in Table 1.

*Table 1 – Non-Statutory Designated Sites*

| Site Name                                   | Distance from site |
|---------------------------------------------|--------------------|
| The Coal, Kennetmouth and Kings Meadow East | 0.2km N            |
| Henley Road Gravel Pit                      | 0.3km NE           |
| Reading Cemetery                            | 0.6km SE           |
| Whiteknights Park                           | 1.6km SE           |
| Thames Valley Park                          | 1.7km NE           |
| River Kennet/ Kennet and Avon Canal         | 1.8km SW           |
| Whitley Park Farm/St Patricks Hall Pond     | 2km S              |
| Holy Brook                                  | 2km SW             |

#### *Ancient Woodland*

- 4.1.3 There are 2 areas of Ancient Semi-Natural Woodland (ASNW) within 2km of the site. The nearest ancient woodland is located approximately 1.2km north-east of the site.

#### *UK BAP Priority Habitats*

- 4.1.4 UK BAP Priority Habitats within 2km of the site are listed below in Table 2.

*Table 2 – UK BAP Priority Habitats*

| Site Name                            | Distance from site |
|--------------------------------------|--------------------|
| Deciduous Woodland                   | 0.1km N            |
| Good quality semi-improved grassland | 0.9km NW           |
| Wood-pasture and Parkland            | 1.3km SE           |
| Lowland ferns                        | 1.9km NE           |

*Protected or Notable Species**Bats*

4.1.5 Table 3 provides details of the species records closest to the site.

*Table 3 – Bat Species Recorded within 2km of the site*

| Species               | Scientific Name                  | Legal Protection / Conservation Priority Status           |
|-----------------------|----------------------------------|-----------------------------------------------------------|
| Common pipistrelle    | <i>Pipistrellus pipistrellus</i> | HabDir:A4; Berne:A3; Bonn:A2; WCA5                        |
| Soprano pipistrelle   | <i>P. pygmaeus</i>               | HabDir:A4; Berne:A2; Bonn:A2; BAP; S41; WCA5              |
| Brown long-eared bat  | <i>Plecotus auritus</i>          | HabDir:A4; Berne:A2; Bonn:A2; BAP; S41; WCA5; KRDB2       |
| Long-eared bat        | <i>Plecotus</i>                  | HabDir-A4; HabReg-Sch2; WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b |
| Noctule               | <i>Nyctalus noctula</i>          | HabDir:A4; Berne:A2; Bonn:A2; BAP; S41; WCA5; KRDB2       |
| Lesser bat            | <i>N. leisleri</i>               | HabDir:A4; Berne:A2; Bonn:A2; WCA5; KRDB1                 |
| Daubenton's bat       | <i>Myotis daubentonii</i>        | HabDir:A4; Berne:A2; Bonn:A2; WCA5                        |
| Serotine              | <i>Eptesicus serotinus</i>       | HabDir-A4; HabReg-Sch2; WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b |
| Nathusius pipistrelle | <i>Pipistrellus nathusii</i>     | HabDir-A4; HabReg-Sch2; WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b |

*Other Mammals*

4.1.6 Table 4 below provides details of those records closest to the site.

*Table 4 – Relevant other mammals Records within 2km of the Site*

| Common Name         | Scientific Name            | Legal Protection / Conservation Priority Status | Closest record | Date |
|---------------------|----------------------------|-------------------------------------------------|----------------|------|
| Eurasian Badger     | <i>Meles meles</i>         | Bern_III, Badger Act                            | 0.94km NE      | 2009 |
| European Otter      | <i>Lutra lutra</i>         | HabDir-A2np; HabDir-A4                          | 0.3km S        | 2016 |
| European Hedgehog   | <i>Erinaceus europaeus</i> | Bern_III                                        | 1km E          | 2006 |
| European Water Vole | <i>Arvicola amphibius</i>  | WACA-Sch5-s9.4a/s9.4b/s9.4c                     | 1.3km NE       | 2012 |

*Birds*

- 4.1.7 Recorded species of conservation concern of potential relevance to the site are presented in Table 5.

*Table 5 – Relevant Bird Records within 2km of the Site*

| Common Name    | Scientific Name            | Legal Protection / Conservation Priority Status     |
|----------------|----------------------------|-----------------------------------------------------|
| Yellow Wagtail | <i>Motacilla flava</i>     | BAP; Berne:A2; BoCC4:Red; S41; KRDB2                |
| Grey Wagtail   | <i>Motacilla cinerea</i>   | Berne:A2; BoCC4:Red                                 |
| Dunnock        | <i>Prunella modularis</i>  | BAP; Berne:A2; BoCC4:Amber; S41                     |
| Tawny Owl      | <i>Strix aluco</i>         | Berne:A2; BoCC4:Amber; Bonn:A2; KRDB3               |
| Mistle Thrush  | <i>Turdus viscivorus</i>   | Berne:A3; BoCC4:Red; BirdsDir:A2.2                  |
| Song Thrush    | <i>Turdus philomelos</i>   | BAP; Berne:A3; BoCC4:Red; BirdsDir:A2.2; KRDB2; S41 |
| Redwing        | <i>Turdus iliacus</i>      | Berne:A3; BoCC4:Red; BirdsDir:A2.2; WCA1            |
| Starling       | <i>Sturnus vulgaris</i>    | BAP; BoCC4:Red; BirdsDir:A2.2; S41; KRDB2           |
| House Sparrow  | <i>Passer domesticus</i>   | BAP; BoCC4:Red; KRDB2; S41                          |
| Tree Sparrow   | <i>Passer montanus</i>     | BAP; Berne:A3; BoCC4:Red; KRDB2; S41                |
| Kestrel        | <i>Falco tinnunculus</i>   | BirdsDir-A1; WACA-Sch1-p1                           |
| Linnet         | <i>Carduelis cannabina</i> | BAP; Berne:A2; BoCC4:Red; KRDB2; S41                |
| Bullfinch      | <i>Pyrrhula pyrrhula</i>   | BAP; Berne:A3; BoCC4:Amber; S41                     |
| Red Kite       | <i>Milvus milvus</i>       | BirdsDir-A1; WACA-Sch1-p1                           |
| House Martin   | <i>Delichon urbica</i>     | Berne:A2; BoCC4:Amber                               |

*Amphibians*

- 4.1.8 Amphibian species of conservation concern that are likely to utilise the site are presented in Table 6.

*Table 6 – Relevant Amphibian Records within 2km of the Site*

| Species            | Scientific Name             | Legal Protection / Conservation Priority Status | Closest Record | Date |
|--------------------|-----------------------------|-------------------------------------------------|----------------|------|
| Grass snake        | <i>Natrix natrix</i>        | Bern_III, WCA5(p)                               | 0.41km NW      | 2008 |
| Slow-worm          | <i>Anguis fragilis</i>      | Bern_III, WCA5(p)                               | 0.89km W       | 1982 |
| Great crested newt | <i>Triturus cristatus</i>   | ECH_II, Bern_II, WCA5, CRoW                     | 0.94km NW      | 2017 |
| Smooth Newt        | <i>Lissotriton vulgaris</i> | Bern_III, WCA5(p)                               | 1.3km N        | 1988 |

### Reptiles

4.1.9 Reptile records closest to the site are presented in Table 7.

Table 7 – Relevant Reptile Records within 2km of the Site

| Species       | Scientific Name         | Legal Protection / Conservation Priority Status | Closest record | Date |
|---------------|-------------------------|-------------------------------------------------|----------------|------|
| Adder         | <i>Vipera berus</i>     | Bern_III, WCA5(p)                               | 1.7km N        | 2008 |
| Common Lizard | <i>Zootoca vivipara</i> | Bern_III, WCA5(p)                               | 1.78km NE      | 2013 |

### Invertebrates -

4.1.10 BAP priority species of potential relevance to the site that were highlighted within the desk study area are presented in Table 8.

Table 8 – Invertebrates within 2km of the Site

| Common Name | Scientific Name       | Legal Protection / Conservation Priority Status |
|-------------|-----------------------|-------------------------------------------------|
| Stag Beetle | <i>Lucanus cervus</i> | Notable-B, UKBAP_P, NERC_S.41                   |

## 4.2 Phase I Habitat Survey

4.2.1 The following habitat types were recorded within the site:

- Hardstanding
- Dense scrub
- Trees
- Buildings

### Hardstanding

4.2.2 The majority of the site is covered by hardstanding. Totalling an area of approximately 6,700m<sup>2</sup>, this habitat is in reasonable condition and is subject to regular use by SGN workers. An access track leads to the area of hardstanding and buildings currently used by SGN. The hardstanding has become vegetated in places and species identified include buddleia *Buddleja davidii*. These areas are, however, trimmed regularly.

### Dense scrub

4.2.3 An area of approximately 340m<sup>2</sup> of dense scrub is present along the southern boundary of the site. This area is dominated by bramble *Rubus fruticosus*, ivy *Hedera helix*, dogwood *Cornus*

*sp.*, buddleia and herb Robert *Geranium robertianum*. A small area of scrub (50m<sup>2</sup>) comprising buddleia is present in the north-western corner of the site.

#### *Trees*

- 4.2.4 Mature trees are present on the sites southern boundary. Species recorded include sycamore maple *Acer pseudoplatanus*, rowan *Sorbus aucuparia*, elm *Ulmus sp.*, common alder *Alnus glutinosa*, silver birch *Betula pendula* and Norway maple *Acer platanooides*. There is an area of bare ground beneath the trees.

#### *Buildings*

- 4.2.5 Five buildings are present on site. These are described in more detail in section 4.3 below.

### **4.3 Protected Species**

#### *Badgers*

- 4.3.1 No evidence of badgers was noted during the survey.

#### *Bats Roosting Habitat - Buildings*

##### Building 1

- 4.3.2 B1 is a single storey building measuring approximately 7.5m x 4.8m in size. The walls are of brick construction to a height of 3.8m and the roof has a covering of concrete tiles. Overall the walls, fascia's and roof are in good condition. However, Potential Roosting Features (PRF) and access points for bats are present within the building's exterior in the form of raised tiles and gaps under the soffits.

- 4.3.3 Access to the interior of the building was not available during the survey.

##### Building 2

- 4.3.4 B2 is a single storey building measuring approximately 7.5m x 4.8m in size. The walls are of brick construction to the height of 4m with a concrete tiled flat roof. The walls, soffits, fascia's and roof are in good condition. PRF's and access points for bats are limited to a single hole in the brick work.

- 4.3.5 Access to the interior of the building was not available during the survey.

##### Building 3-5

- 4.3.6 B3-B5 are single storey buildings. B3 is a sub station and B4-B5 are used by SGN staff as an office. None offer any PRF for bats.

#### *Bats Roosting Habitat - Trees*

- 4.3.7 Trees with potential to support roosting bats are described in Table 10 below. Tree locations are provided in Figure 1. For clarity tree numbers are matched to those in the associated

arboricultural report (J20563\_Arb). All other trees present within the site are healthy and in good condition and show no potential bat roosting features.

*Table 9 – Tree Survey Results*

| Tree No. | Species  | DBH / mm | Description of features                                      | Level of Potential |
|----------|----------|----------|--------------------------------------------------------------|--------------------|
| T2       | Sycamore | 600      | Old pollard. WPH on eastern aspect at 5 metres - may extend. | Moderate           |

*Foraging and Commuting Habitat*

- 4.3.8 The site offers limited habitat for foraging. However, its immediate surroundings offer suitable foraging habitat and commuting routes in the form of the tree/vegetation lines on the northern and southern boundaries. The site is well connected to suitable foraging areas in the wider landscape including the River Kennett to the south and the railway line to the north.

*Birds*

- 4.3.9 Suitable nesting habitat is limited to the area of scrub and the vegetated boundaries. No evidence of nesting birds was recorded during the survey.

*Dormouse*

- 4.3.10 No suitable dormouse habitat is present within the site. The scrub and boundary vegetation are too fragmented to offer suitable habitat and the wider landscape is also unsuitable.

*Great Crested Newt*

- 4.3.11 No waterbodies are mapped within 250m and so no assessment of the terrestrial habitat was required.

*Reptiles*

- 4.3.12 The site offers a limited area of suitable reptile habitat. The adjacent railway which runs along the sites northern boundary provides suitable reptile habitat and connectivity to areas of reptile habitat in the wider landscape.

*Other species*

- 4.3.13 No evidence of other protected species was recorded.

## 5 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Designated Areas

- 5.1.1 No statutory designated sites are located within 2km of the site and none will be affected by the proposed development.
- 5.1.2 The closest non-statutory site is 0.2km north of the site and lies beyond the railway line. The small-scale and localised nature of development is not considered likely to adversely impact this site or any other designated site.

### 5.2 Ancient Woodland

- 5.2.1 The nearest ancient woodland site is located 1.2km from the site, which is well beyond the 15m buffer recommended by Natural England the Forestry Commission when working near ancient woodland sites. The development of this site will have no detrimental impact on any area of ancient woodland.

### 5.3 Habitats and Botanical Species of Interest

- 5.3.1 The closest UK BAP priority habitat is 0.1km from the site and beyond the railway line. As a result, it will not be affected by the development.
- 5.3.2 The habitats within the site are common and widespread and no further botanically specific surveys are required in this instance.
- 5.3.3 Should any boundary trees require removal, it is recommended that they are compensated by like-for-like replacement within the site. Should any non-native trees require removal, compensatory planting using UK native tree species is recommended. Some suitable tree species are provided in Section 6 below.
- 5.3.4 Protection of retained trees is discussed in the associated arboricultural report (J20563\_Arb).

### 5.4 Protected Species

#### *Badger*

- 5.4.1 No evidence of badger was recorded, and no historical evidence of badgers has been reported within or in close proximity to the site. No further surveys for badgers are required.

#### *Bats*

#### *Roosting Habitat- Buildings*

- 5.4.2 PRF recorded on the building denoted B1 were limited and in isolation the structure would be considered Negligible for its suitability to support roosting bats. However, historical records of nine species of bat exist within the desk study area and the foraging and commuting habitat

in the form of the river and railway which lies adjacent to the site, offer excellent habitat for bats. Consequently, the building denoted B1 has **'Negligible/Low'** suitability. As a precautionary measure, to determine its use by roosting bats, should this building be affected by the development, it should be subject to a single evening emergence survey.

5.4.3 As development of the site will likely result in the loss and/or disturbance of any bat roost present in B1, no works to B1 should take place until further survey for bats has been undertaken.

5.4.4 No further surveys are required for buildings B2-B5, which have been classified as having **'Negligible'** potential.

#### *Roosting Habitat- Trees*

5.4.5 Potential roosting features for bats have been identified in the tree T2 and should this tree require removal and/or works that are likely to impact on the woodpecker hole of interest, it should be subject to an elevated inspection, prior to the start of works. Note: tree roosts for bats are highly dynamic and application of climb and inspect would ideally be conducted <6 months prior to commencement of works that will impact the tree. Consequently, application of this survey should not be considered restrictive to approval of the planning application.

5.4.6 Should evidence of bats or features suitable to support bats be identified during the elevated inspection, then further surveys and/or a European Protected Species Mitigation Licence may be required prior to the start of works.

#### *Bats – Foraging and Commuting Habitat*

5.4.7 Foraging and commuting habitat is present in the form of tree/vegetation lines on the northern and southern boundaries. Should any boundary tree or vegetation require removal, it is recommended that additional boundary planting is undertaken to maintain the continuity of this habitat.

5.4.8 Although best set out upon completion of the above-mentioned bat survey, lighting can be detrimental to how bats use a site for foraging and commuting and consideration to a sensitive lighting strategy should be implemented within the design.

#### *Birds*

5.4.9 Suitable nesting habitat is present on site in the form of trees, scrub and buildings.

5.4.10 As all breeding birds are protected under the Wildlife and Countryside Act 1981 (as amended) it is recommended that works to these areas and any other areas deemed suitable for nesting

birds, such as trees, are conducted outside the core breeding period for birds of Late February – August inclusive.

5.4.11 Should this timeframe be unobtainable, a thorough search for the presence of breeding birds should be conducted by a suitably experienced ecologist prior to the start of works. Should evidence of breeding birds be recorded, works within 5m of the nest, or works that have potential to destroy the nest, should stop until the eggs have hatched and the chicks fledged, or the nest is deemed by a suitably experienced ecologist to have been abandoned.

5.4.12 Although no evidence to suggest historic or current use by the species was recorded, it is understood that a peregrine falcon *Falco peregrinus* is known to use the gas holder for the purposes of roosting (*Pers comms*). Having identified the sites suitability to support the species, inclusion of a peregrine nest ledge has been included within the design.

#### *Dormouse*

5.4.13 No suitable dormouse habitat is present, and no historical records of dormice were identified within the desk study area. No further dormouse surveys are required.

#### *Great Crested Newt*

5.4.14 Although a restricted area of suitable terrestrial habitat exists within the site, the site and wider area lack the network of waterbodies that great crested newts require to breed. Great crested newts are therefore considered unlikely to be present on the site. No further surveys for the species are required.

#### *Reptiles*

5.4.15 A small area of scrub in the south of the site provides suitable reptile habitat and historical records of reptiles exists within the wider area. However, the suitable habitats lack connectivity with the railway and or alternate suitable habitats and reptiles are considered likely to be absent. No further surveys for reptiles are required.

#### *Other species*

5.4.16 There are no obvious and immediate issues regarding other protected species on the site and no further surveys to determine the presence of other protected species is required in this instance.

5.4.17 However, should at any point during the development a protected or notable species be identified within the site, then all works should **stop** and the appointed ecologist consulted on the appropriate manner in which to proceed.

## 6 ECOLOGICAL ENHANCEMENTS

6.1 Opportunities to include biodiversity enhancements within the proposed development exist and in accordance with the requirements of the NPPF the following recommendations are considered appropriate for this site:

- To benefit a diversity of bird species 5 x integrated bird boxes, such as those provided by <http://www.habibat.co.uk/category/bird-boxes> should be erected into the elevations of the proposed buildings. To maximise suitability the boxes should be installed on sheltered aspects close to vegetation at a height of 2-3m, preferably on north, north-east or north-west facing elevations.
- To benefit a diversity of bat species 5 x integrated bat boxes, such as those provided by <http://www.habibat.co.uk/category/bat-boxes> should be erected into the elevations of the proposed buildings. To maximise suitability the boxes should be installed on sheltered aspects close to vegetation at a height of 3 - 8m, preferably on north, east or west facing elevations.
- The incorporation of a native wildlife-friendly planting scheme within the grounds post-development would be of benefit to invertebrates, and subsequently species such as amphibians, birds and bats.
- The boundary vegetation should be enhanced through the planting of native species rich hedgerows and trees.
- All tree planting should be undertaken using native species such as pedunculate oak, small leaved lime *Tilia cordata*, black poplar *Poplar nigra*, wild service tree *Sorbus torminalis* or similar.
- To account for the nearby historical record of hedgehog, the incorporation of hedgehog boxes at suitable locations within vegetated areas of the site would provide an enhancement for this species. Boxes should ideally be located within the northern or southern boundary vegetation. The design of the houses should loosely follow those available at the following link; <https://www.britishhedgehogs.org.uk/hedgehog-homes/>

## 7 SUMMARY

- 7.1 In response to proposed redevelopment of the Gas Holder Site at Alexander Turner Close, Reading, the site has been subject to a Preliminary Ecological Appraisal.
- 7.2 The site's potential to support protected species and habitats has been assessed and appropriate recommendations provided.
- 7.3 The small-scale, localised development is considered unlikely to result in a negative impact to designated sites, ancient woodland or priority habitats.
- 7.4 Like-for-like replacement planting is recommended for any trees lost to the development. Should any non-native trees require removal, compensatory planting using UK native tree species is recommended
- 7.5 B1 and T2 has potential to support roosting bats and to determine their suitability for the species further surveys / inspections have been recommended. B1 requires 1 x emergence survey as a precaution. Should it be affected by the proposed, T2 requires an elevated inspection ideally no more than 6 months prior to commencement of associated works.
- 7.6 Suitable nesting habitat for birds will be affected. Consequently, recommendations in regard to timings and methods of best practice for breeding birds have been provided. To offset the loss of the peregrine falcon nesting habitat, a suitable ledge has been provided in the final design.
- 7.7 The likelihood of other protected and notable species to occur within the site is considered negligible and no further surveys for other protected species are required. However, should at any point during the development a protected or notable species be identified within the site then all works should stop and the appointed ecologist consulted on the appropriate manner in which to proceed.
- 7.8 In accordance with the requirement of the NPPF, recommendations to enhance the site's suitability for wildlife have been provided.

## 8 REFERENCES

Collins, J. (ed.) 2016. Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> edn). Bat Conservation Trust, London.

JNCC (2010). Handbook for Phase I Habitat Survey; A Technique for Environmental Audit. Peterborough.

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[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/740441/National\\_Planning\\_Policy\\_Framework\\_web\\_accessible\\_version.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf)

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<http://www.legislation.gov.uk/ukpga/2006/16/contents>

Protection of Badgers Act (1992). <http://www.legislation.gov.uk/ukpga/1992/51>

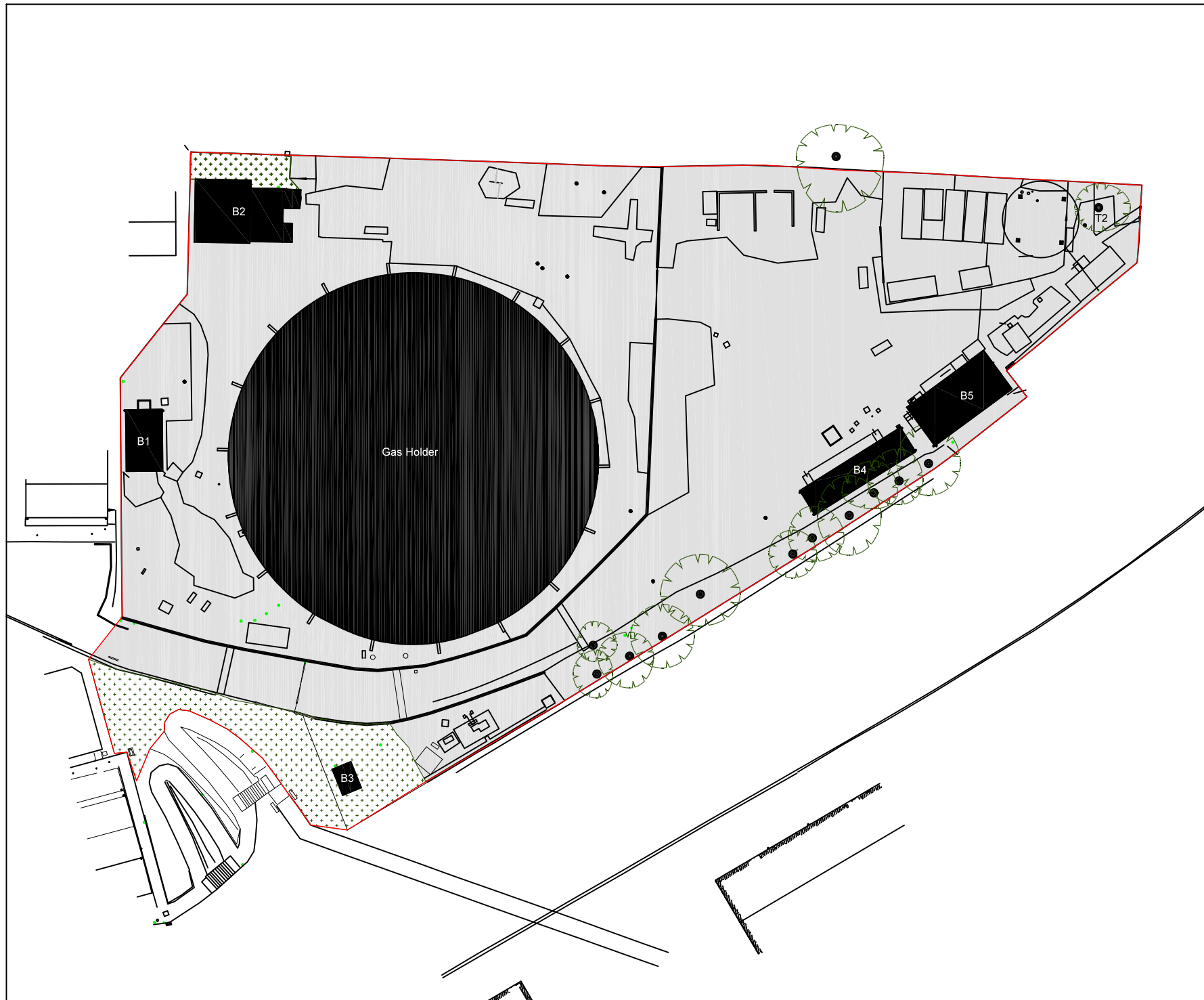
Stace (2010). New Flora of the British Isles (Third Edition). Cambridge University Press

The Conservation of Habitats and Species Regulations (Habitats Regulations) 2017.

<http://www.legislation.gov.uk/uksi/2017/1012/made>

Wildlife and Countryside Act (as amended) 1981. <http://jncc.defra.gov.uk/page-1377>

# Figures



# Legend

- Site Boundary
- Hardstanding
- Building
- Scrub
- Tree



Job Reference : J20563

Project Title  
Reading SGN Site

Drawing Title  
Figure 1: Site Boundary

Date : 21-09-18 Checked : GN

Drawn : JJ Approved : N/A

Status : Final Scale : NTS

# Appendices

## APPENDIX A – PHOTOGRAPHS



Plate 1. Areas of vegetated hard standing



Plate 2. Gasholder located within the site



Plate 3: Building 2



Plate 4. Building 2



Plate 5. Area of dense scrub

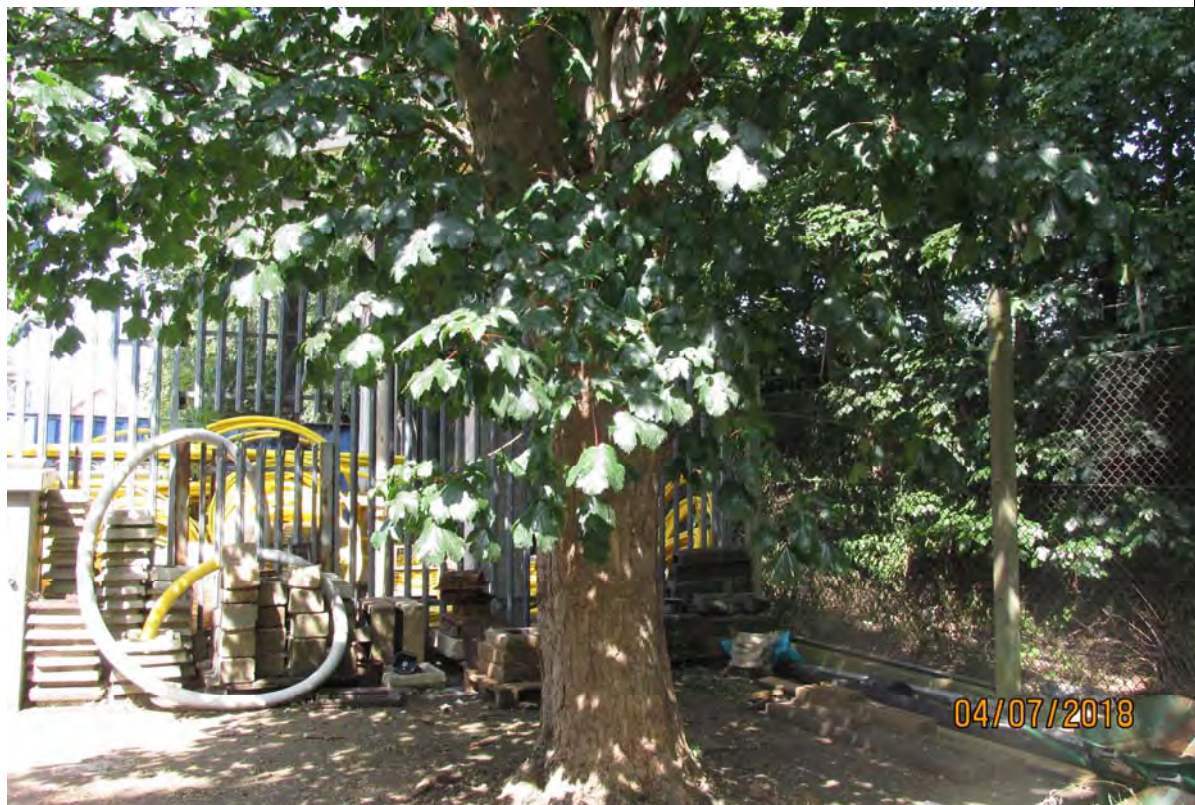


Plate 6. T2

## APPENDIX B

### Categories of Bat Roost Potential

| Roost type<br>Level of potential | Summer Roost used by Non- Breeding Bats                                                                                                                              | Maternity Roost                                                                                                                                                                         | Hibernation Roost                                                                                                                                                                             |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Confirmed roost                  | Presence of bats or evidence of bats identified. Confirmation of a roost will likely require further surveys.                                                        |                                                                                                                                                                                         |                                                                                                                                                                                               |
| High                             | Building/Structure or tree with multiple opportunities for one or more species of roosting bat. Optimal orientation. Good connectivity to optimal foraging habitats. | Building/Structure or tree with multiple roosting opportunities for pregnant female bats and young pups. Optimal orientation. Good connectivity to optimal foraging habitats.           | Building/Structure or tree that has suitable thermal stability and levels of humidity to support torpid bats throughout the winter months.                                                    |
| Moderate                         | Building/Structure for tree with some opportunities for roosting bats. Preferable orientation. Connectivity to moderate to high quality foraging habitat available.  | Building/Structure or tree with some roosting opportunities for pregnant female bats and young pups. Good orientation. Good connectivity to moderate to high quality foraging habitats. | Building/Structure or tree that has suitable thermal stability and levels of humidity to support torpid bats for some of the winter months. Moderate connectivity to suitable foraging areas. |
| Low                              | Building/Structure or tree with limited opportunities for roosting bats. Poor connectivity to foraging habitat.                                                      | Building/Structure or tree with limited opportunities for breeding bats. Poor connectivity to foraging habitat.                                                                         | Building/Structure or tree with limited potential to support hibernating bats due to instable environmental conditions.                                                                       |
| Negligible                       | Building/Structure or tree with no or very limited opportunities for roosting bats. Little to no connectivity to foraging habitat                                    | Building/Structure or tree with no or very limited opportunities for breeding bats. Little to no connectivity to foraging habitat.                                                      | No suitable roosting opportunities for hibernating bats.                                                                                                                                      |

## APPENDIX C

### **Minimum Number of Bat Surveys Required in Most Instances**

| Negligible                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Low roost potential                                                                                                                                                                                                             | Moderate roost potential                                                                                                                                                                        | High roost potential*                                                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dusk emergence and/or pre-dawn re-entry surveys unlikely to be required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>Structures: 1 survey visit. 1 dusk emergence or pre-dawn re-entry survey<sup>a</sup>.</p> <p>To be conducted during May – August.</p> <p>Trees: Dusk emergence and/or pre-dawn re-entry surveys unlikely to be required.</p> | <p>2 separate survey visits. 1 dusk emergence survey and 1 pre-dawn re-entry survey<sup>b</sup>.</p> <p>To be conducted during May-September with at least one of the surveys May – August.</p> | <p>3 separate survey visits. At least 1 dusk emergence survey and a separate pre-dawn re-entry survey. The third visit could be either a dusk or dawn survey<sup>b</sup>.</p> <p>To be undertaken during May-September with at least two of the surveys between May and August.</p> |
| <p><sup>a</sup> Structures that have been categorised as low potential can be problematic and the number of surveys required should be judged on a case by case basis. If there is a possibility that quiet calling, late-emerging species are present then a dawn survey may be more appropriate, providing weather conditions are suitable. In some cases, more than one survey may be needed, particularly where there are several buildings in this category.</p> <p><sup>b</sup> Multiple survey visits should be spread out to sample as much of the recommended survey period as possible; It is recommended that surveys are spaced out at least two weeks apart, preferably more. A dawn survey immediately after a dusk survey is considered one visit. If there is potential for a maternity colony, then consideration should be given to seasonal detectability and the ecologist should use their professional judgement to design the most appropriate survey regime.</p> <p>*For the purpose of this exercise a confirmed roost is considered under the criteria of 'High roost potential'</p> |                                                                                                                                                                                                                                 |                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                     |

## Appendix C

# SGN Gas Holder No. 4 Reading

Bat Roost & Interim Activity Survey Report

A Report for Danescroft (Kenavon Drive  
Project Management) LLP

August 2019



[www.greenspace-ecology.co.uk](http://www.greenspace-ecology.co.uk)

[info@greenspace-ecology.co.uk](mailto:info@greenspace-ecology.co.uk)

# SGN Gas Holder No. 4, Reading

## Bat Roost & Interim Activity Survey Report

Controlled Copy

01 of 02

01 Danescroft (Kenavon Drive Project Management) LLP

02 Greenspace Ecological Solutions Ltd

Report Contributors: Gemma Abela and James Johnston ACIEEM

Proofread: Guy Newman MCIEEM

*The content of this report is the responsibility of Greenspace Ecological Solutions Ltd.  
It should be noted that whilst every effort has been made to meet the client's requirements, no site survey can ensure complete assessment or prediction of the changeable onsite environment. Furthermore, should more than 12 months elapse between the date of this survey and any subsequent development, it may be necessary to consider the need for an update survey to be undertaken.*

Report Number J20563\_P4

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## 1 PROJECT OVERVIEW

Client: Danescroft (Kenavon Drive Project Management) LLP

Site Address: SGN Gas Holder No. 4, Kenavon Drive, Reading, RG1 3DH

Attending Ecologists: James Johnston (NE Bat Class 2 Licence)  
Joseph Dyson (NE Bat Class 1 Licence)  
Martin Rann  
Tanya Rowlinson  
Gemma Abela  
Mike Marriott

Survey Period: 26<sup>th</sup> September 2018 – 13<sup>th</sup> August 2019

Site Proposals: Redevelopment of an existing brownfield site to facilitate a new residential development with associated parking.

Associated Planning Reference Number: Not yet submitted.

Source of Relevant Documents:

| Document:         | Source:                                                                          |
|-------------------|----------------------------------------------------------------------------------|
| Previous Reports: | Preliminary Ecological Appraisal, Greenspace Ecological Solutions, October, 2018 |

---

## 2 INTRODUCTION

### 2.1 Context

2.1.1 In response to the redevelopment of the SGN Gas Holder No.4 Kenavon Drive, Reading, a Preliminary Ecological Appraisal (PEA) was undertaken by Greenspace Ecological Solutions Ltd (GES) in October 2018. Recommendations made within that report identified the need for further considerations to bats and GES was subsequently commissioned to undertake an elevated tree roost assessment of a tree, bat roost presence/likely absence surveys of the building denoted B1 and bat activity surveys of the area surrounding the site.

2.1.2 The results of the surveys, as described in this report, serve to ensure that the Favourable Conservation Status (FCS) of bats is maintained throughout the development and that the proposals remain compliant with existing legislation and planning policies which serve to protect bats and their roosts. Where appropriate, proportionate mitigation to be incorporated within the design of the building, has been provided within this report.

### 2.2 Site Location

2.2.1 The site is located on the eastern edge of the town of Reading, Berkshire, at National Grid Reference SU 728 736.

### 2.3 Site Description

2.3.1 The site occupies approximately 0.71ha and comprises areas of scrub, scattered trees and buildings within areas of hard standing. A prominent gas holder is also present within the site.

2.3.2 The site is bound by residential dwellings to the west; the River Kennett to the south and east; and the National Rail link to the north. The wider landscape is typical of an urban area.

### 2.4 Policies and Legislation

2.4.1 The National Planning Policy Framework 2019 (NPPF) aims to protect species of significant conservation importance in England (in this case bats), as covered by wildlife legislation (see below), NPPF, national and local Biodiversity Action Plans (BAP's) and Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Local planning authorities have an obligation to protect such species and are also required to seek opportunities to promote and enhance biodiversity in accordance with the above legislation, policies and plans.

2.4.2 All British bat species and their places of rest and shelter receive UK and European protection under the Conservation of Habitats and Species Regulation 2018 (Habitats Regulations 2018)

and the Wildlife and Countryside Act (WCA) 1981 (as amended). This protection means that bats and their places of rest and shelter are a material consideration in the planning process.

**2.4.3** Taken together, unless under licence, these make it an offence to:

- Deliberately capture or intentionally take a bat;
- Deliberately or intentionally kill or injure a bat;
- To be in possession or control of any live or dead bat or any part of, or anything derived from a bat;
- Damage or destroy a breeding site or resting place of a bat;
- Intentionally or recklessly obstruct access to any place that a bat uses for shelter or protection;
- Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection;
- Deliberately disturb any bat, in particular any disturbance which is likely to (i) impair their ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) to affect significantly the local distribution or abundance of the species to which they belong.
- A bat roost may be any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to use the same roost sites at different times of year, current legal opinion is that a bat roost is protected whether bats are present at the time.

**2.4.4** In addition to the above, certain species of bat are listed on Annex II of the Habitat Regulations 2018. Annex II species include greater and lesser horseshoe bats, barbastelle and Bechstein's bat. Where present, consideration to the requirement of a Special Areas of Conservation (SAC) should be given.

**2.5 Objectives of the Survey**

**2.5.1** The objectives of the surveys were to:

- Determine the presence of bats within the building to be affected by the proposal,
- Gather baseline information on the species of bat using the site and adjacent habitats;
- Determine favoured foraging habitats and commuting routes that are likely to be affected by the proposed;
- Identify species, number and frequency of use of the site by bats should they be present;

- Evaluate the potential for bats to be affected by proposals;
- Identify legal or policy constraints related to bats that may affect the development; and
- Suggest mitigation/compensation measures that may be required.

## **2.6 Survey Constraints**

- 2.6.1 To ensure reasonable effort to determine the bat activity within the site is applied, activity surveys are to be continued until October 2019. This report therefore serves as an interim to support the associated application and the outstanding data will be added as it becomes available.
- 2.6.2 The results taken from bat detector recordings are biased towards bats that use louder echolocation calls. Therefore, quiet species such as long-eared bats may be under recorded due to the limited recording range of the equipment. To compensate for this, the surveyors remained vigilant to ensure that any visual cues identifying the presence of this species were accurately recorded.
- 2.6.3 It is difficult to confidently relate calls registered to numbers of bats present therefore, the number of bat passes does not provide any indication of bat abundance; it is intended only to indicate the level of activity at a particular point.
- 2.6.4 During the walked transect on 18<sup>th</sup> July 2019, a kit failure resulted in a lack of recordings for the duration of the survey. The results for this section are therefore based on the field observations noted by the surveyor at the time of the survey.
- 2.6.5 Where identification is difficult to distinguish at an individual species level, bat passes are described to genus level such as *Myotis* sp., *Nyctalus* sp., *Pipistrellus* sp.

### 3 SURVEY METHODOLOGY

#### 3.1 Elevated Tree Roost Assessment

3.1.1 An elevated tree roost assessment was undertaken of T2 on the 17<sup>th</sup> July 2019 by licenced bat ecologist James Johnston.

3.1.2 The survey was completed in accordance with the guidelines set out by the Bat Conservation Trust (BCT) (Collins, 2016) and equipment used included a ladder and an endoscope. Suitable features identified during the ground level assessment were inspected for any evidence of bats and to determine their suitability for roosting bats.

#### 3.2 Bat Emergence Surveys

3.2.1 A dusk emergence survey was undertaken of the on-site building denoted B1 on the 26<sup>th</sup> September 2018 and 17<sup>th</sup> July 2019. The survey was completed in accordance with current best practice guidance (Collins, 2016) and to adequately observe all aspects of the buildings, two surveyors were deployed during each survey. The location of the surveyors is depicted in Figure 1.

3.2.2 The survey was completed in favourable weather conditions with night-time temperatures of  $\geq 10^{\circ}\text{C}$  and little or no rain.

3.2.3 To account for the varying times in which differing bat species emerge, evening emergence surveys commenced 15 minutes before sunset and continued for 1 hour and 15 minutes after sunset, or until light levels deemed the survey no longer valid.

3.2.4 A summary of the weather conditions, surveyors and survey times recorded during the survey is provided in Table 1.

*Table 1 – Survey Times and Conditions*

| Date     | Sunset time | Start Time | End Time | Surveyors                       | Start Weather Conditions           | End Weather Conditions              |
|----------|-------------|------------|----------|---------------------------------|------------------------------------|-------------------------------------|
| 26/09/18 | 18:52       | 18:37      | 20:07    | James Johnston<br>Gemma Abela   | 17.0°C, 0% CC, no rain, wind 0BF   | 15.0°C, 0% CC, no rain, wind 0BF    |
| 17/07/19 | 21:12       | 20:57      | 22:27    | James Johnston<br>Mike Marriott | 18.0 °C, 98% CC, no rain, wind 2BF | 17.0 °C, 100% CC, no rain, wind 2BF |

3.2.5 To aid audible detection, surveyors were equipped with Elekon Batlogger M bat detectors. These detectors convert the inaudible echolocation of bats into a frequency audible to the

human ear. All calls were digitally recorded, and the sonograms later analysed through the application of the computer programme Elekon BatExplorer.

### 3.3 Bat Transect Surveys

- 3.3.1 The methodology for bat transect surveys follows the guidance set out by the Bat Conservation Trust (Collins, 2016). The primary objective of the transects were to identify foraging areas, commuting routes and species utilisation of the site.
- 3.3.2 To ensure coverage of the site, the transect routes were determined prior to the survey. To identify activity levels around the features of potential value to bats that are to be most affected by the proposals (i.e. hedgerows/tree lines/scrub habitats etc.) point count stops were included in strategic locations along the route. Each point count was 3 minutes long, during which time all bat activity was recorded.
- 3.3.3 The dusk transects commenced at and ran for a period of approximately 2hrs after sunset.
- 3.3.4 Each transect was walked at a steady pace with the species, time and behaviour of all bat passes recorded on a Site plan. The information gathered provides a general view of the bat activity present on Site and identifies the key foraging area and commuting routes. Elekon Batlogger M detectors were utilised, with the location of each call logged using the GPS facility provided within the unit.
- 3.3.5 Post-survey the peak frequency, inter-pulse interval, call duration and end frequency of the recorded bat calls were analysed using Bat Explorer. Analysis was undertaken by suitably experienced bat ecologists, with the level of bat species and activity across the site, in relation to the abundance of individual species foraging and commuting along the associated habitats, assessed accordingly.
- 3.3.6 All transects were undertaken in suitable weather conditions. A summary of the survey times, surveyors and weather conditions recorded during the surveys is provided in Table 2.

*Table 2 – Bat Transect Survey Conditions*

| Date     | Survey Start | Survey End | Sunset/Sunrise Time | Start Weather Conditions      | End Weather Conditions        | Surveyors                         |
|----------|--------------|------------|---------------------|-------------------------------|-------------------------------|-----------------------------------|
| 29/04/19 | 20:23        | 22:23      | 20:23               | 13.0°C, 78% CC, dry, wind OBF | 12.0°C, 90% CC, dry, wind OBF | Joseph Dyson<br>Tanya Rowlinson   |
| 21/05/18 | 20:57        | 22:47      | 20:57               | 17.0°C, 5% CC, dry, wind OBF  | 14.5°C, 0% CC, dry, wind OBF  | James Johnston<br>Tabitha Plummer |

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|          |       |       |       |                                |                                       |                                 |
|----------|-------|-------|-------|--------------------------------|---------------------------------------|---------------------------------|
| 26/06/18 | 21:25 | 22:54 | 21:25 | 15.2°C, 100% CC, dry, wind 0BF | 14.8°C, 0% CC, dry, wind 0BF          | Martin Rann<br>Mike Marriott    |
| 18/07/19 | 03:07 | 05:00 | 05:07 | 14.0°C, 100% CC, dry, wind 1BF | 13.5°C, 100% CC, light rain, wind 1BF | James Johnston<br>Mike Marriott |
| 13/08/19 | 20:31 | 22:00 | 21:20 | 20.5°C, 60% CC, dry, wind 0BF  | 17.0°C, 80% CC, dry, wind 0BF         | Martin Rann<br>Mike Marriott    |

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*Bat Static Activity Survey*

- 3.3.7 In conjunction with the transect surveys, two Anabat Express static bat detectors were deployed to gather data on bat activity within the site. The static detectors were deployed in strategic places within the site. In this instance, the detectors were deployed on the northern railway and southern river corridor boundaries. The location of the detectors was chosen to maximise coverage of the suitable habitats likely to be affected, directly or indirectly, by the proposed. These locations are depicted in Figure 2.
- 3.3.8 To account for the periods in which the lighting impacts are most likely to occur within the site, each static detector was programmed to record bat activity from ½ hr before sunset until ½ hr after sunrise during the periods 15<sup>th</sup> May – 19<sup>th</sup> May 2019, 21<sup>st</sup> June – 25<sup>th</sup> June 2019, 17<sup>th</sup> July – 21<sup>st</sup> July 2019 and 8<sup>th</sup> August – 12<sup>th</sup> August 2019. The sunset times during these periods were from 20:48hrs – 20h:54hrs, 21:24hrs – 21:24hrs, 21:12hrs – 21:08hrs and 20:40hrs – 20:32hrs, respectively. The sunrise times during these periods were from 05:12hrs – 05:07hrs, 04:46hrs – 04:47hrs, 05:06hrs – 05:11hrs and 05:37hrs – 05:44hrs, respectively.
- 3.3.9 Upon completion of the data collection period, the static detectors were collected, and the data subsequently analysed using Analook.

## 4 SURVEY RESULTS

### 4.1 Elevated Tree Roost Inspection

- 4.1.1 The elevated inspection of the tree denoted T2 identified no evidence of use by bats and none of the features identified at ground level were considered suitable to support roosting bats.

### 4.2 Emergence Surveys

26th September 2018

- 4.2.1 No bats emerged from the building.
- 4.2.2 The first bat recorded during the survey was a common pipistrelle *Pipistrellus pipistrellus*, which was recorded foraging within the site at 19:37hrs, some 45 minutes after sunset.
- 4.2.3 This species, as well as soprano pipistrelle *P. pygmaeus* and noctule *Nyctalus noctula* were recorded in low numbers foraging within and commuting through the site during the survey.
- 4.2.4 Overall bat activity within the site was considered **Low**.

17<sup>th</sup> July 2019

- 4.2.5 No bats emerged from the building.
- 4.2.6 The first bat recorded was a common pipistrelle, which was recorded within the site at 21:27, some 17 minutes after sunset.
- 4.2.7 Common pipistrelle and soprano pipistrelle were recorded in low numbers foraging and commuting through the site during the survey.
- 4.2.8 Bat activity within the site was considered **Low**.

#### *Summary of Emergence Results*

- 4.2.9 Table 3 shows a summary of the survey results.

*Table 3. Emergence survey results summary*

| Date     | Bats emerging or returning from/to the building | Bat species recorded commuting / foraging within the site |
|----------|-------------------------------------------------|-----------------------------------------------------------|
| 26/09/18 | None                                            | Common pipistrelle<br>Soprano pipistrelle<br>Noctule      |
| 17/07/19 | None                                            | Common pipistrelle<br>Soprano pipistrelle                 |

### 4.3 Walked Transect Surveys

*29<sup>th</sup> April 2019*

- 4.3.1 The April transect recorded a total of 306 passes throughout the survey. As depicted in Figure 3a, the survey identified that 49% of bat passes were of common pipistrelle and 40% of bat passes were soprano pipistrelle. The remaining passes were of noctule (<6% of passes), Myotis sp. (<4% of passes) and long-eared bat (<2% of passes). Activity in April was recorded along the length of the transect route. However, a marked increase in activity was recorded at the bridge to the south of the site and at the confluence of the River Kennet and the River Thames.

*21<sup>st</sup> May 2019*

- 4.3.2 The May transect recorded a total of 215 passes throughout the survey. As depicted in Figure 3b, the survey identified that 36% of bat passes were of soprano pipistrelle and 27% of bat passes were common pipistrelle. The remaining passes were of myotis sp. (25% of passes) and noctule (11% of passes). Activity in May was recorded along the length of the transect route. A marked increase in activity was again recorded at the bridge to the south of the site and along the river toward the confluence of the River Kennet and the River Thames.

*26<sup>th</sup> June 2019*

- 4.3.3 The June transect recorded a total of 100 passes throughout the survey. As depicted in Figure 3c, the survey identified that 57% of bat passes were of common pipistrelle and 24% of bat passes were soprano pipistrelle. The remaining passes were of Myotis sp. (12% of passes), noctule (6% of passes) and serotine (1% of passes). Activity during the June survey was low with peak activity again focussed around the bridge to the south of the site and the confluence of the River Kennet and the River Thames and Network Rail link.

*18<sup>th</sup> July 2019*

- 4.3.4 Constrained due to equipment failure, the surveyor identified that most of the bat passes were common and soprano pipistrelle with some intermittent noctule passes. The July transect recorded a low/moderate level of bat activity during the survey. Several bats were recorded foraging and commuting along the length of transect route with peaks of activity recorded at the bridge to the south of the site and at the confluence of the River Kennet and the River Thames.

*13<sup>th</sup> August 2019*

- 4.3.5 The August transect recorded a total of 141 passes throughout the survey. As depicted in Figure 3d, the survey identified that 52% of bat passes were of soprano pipistrelle and 34% of bat passes were common pipistrelle. The remaining passes were of Myotis sp. (11% of passes)

and noctule (4% of passes). Activity during the August survey was recorded along the length of the transect route. However, there was a marked increase in activity recorded at the bridge to the south of the site and at the National Rail link.

#### **4.4 Static Surveys**

4.4.1 Static detector surveys have been carried out (to date) during the months of May – August 2019.

##### *15<sup>th</sup> May – 19<sup>th</sup> May 2019*

4.4.2 As detailed in Figure 4a, six species of bat (long-eared bat, common pipistrelle, myotis sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the May survey.

4.4.3 The most frequently recorded species was soprano pipistrelle with a total of 2630 passes; 53% of all bat passes recorded across the site. The second most frequently recorded species was common pipistrelle with a total of 2267 passes, equating to 46% of all bat passes. The third most frequently recorded species were bats from the genus *Myotis* sp. with a total of 57 passes, equating to 1% of all bat passes.

4.4.4 Long-eared bats and noctule were recorded in low numbers in the south of the site only. Serotine bats were recorded in low numbers in both locations.

4.4.5 Accounting for 83% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed on the northern railway boundary of the site (Ref: Figure 4a).

4.4.6 During the 30 minutes period after sunset 117 bat passes were recorded. The earliest recording was a soprano pipistrelle at 20:16hrs (32 minutes before sunset) in the south of the site.

4.4.7 During the 30 minutes period prior to sunrise 12 bat passes were recorded. The latest recording was a common pipistrelle at 04:51hrs (18 minutes before sunrise) in the north of the site.

##### *21<sup>st</sup> June – 25<sup>th</sup> June 2019*

4.4.8 As detailed in Figure 4b, five species of bat (common pipistrelle, myotis sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the June survey.

4.4.9 The most frequently recorded species was common pipistrelle with a total of 396 passes; 65% of all bat passes recorded across the site. The second most frequently recorded species was

soprano pipistrelle with a total of 175 passes, equating to 29% of all bat passes. The third most frequently recorded species were bats were noctule with a total of 22 passes, equating to 4% of all bat passes.

4.4.10 Myotis sp. were recorded in low numbers in the south of the site only. Serotine bats were recorded in low numbers in both locations.

4.4.11 Accounting for 87% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed in the north of the site (Ref: Figure 4b).

4.4.12 During the 30 minutes period after sunset 8 bat passes were recorded. The earliest recording was a common pipistrelle at 21:14hrs (10 minutes before sunset) in the south of the site.

4.4.13 During the 30 minutes period prior to sunrise no bat passes were recorded. The latest recording was a soprano pipistrelle at 04:15hrs (31minutes before sunrise) in the north of the site.

*17<sup>th</sup> July – 21<sup>st</sup> July 2019*

4.4.14 As detailed in Figure 4c, four species of bat (common pipistrelle, myotis sp., noctule and soprano pipistrelle) were recorded on the static detectors during the July survey.

4.4.15 The most frequently recorded species was common pipistrelle with a total of 126 passes; 56% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 81 passes, equating to 36% of all bat passes. The third most frequently recorded species were noctule with a total of 10 passes, equating to 4% of all bat passes.

4.4.16 Myotis sp. were recorded in low numbers in both locations within the site.

4.4.17 Accounting for 87% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed in the north of the site (Ref: Figure 4c).

4.4.18 During the 30 minutes period after sunset 1 bat pass was recorded. This recording was a Myotis sp. at 21.27hrs (15 minutes after sunset) in the north of the site.

4.4.19 During the 30 minutes period prior to sunrise 5 bat passes were recorded. The latest recording was a common pipistrelle at 04:45hrs (26 minutes before sunrise) in the north of the site.

*8<sup>th</sup> August – 13<sup>th</sup> August 2019*

- 4.4.20 As detailed in Figure 4d, six species of bat (long-eared bat, common pipistrelle, myotis sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the August survey.
- 4.4.21 The most frequently recorded species was common pipistrelle with a total of 258 passes; 57% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 138 passes, equating to 30% of all bat passes. The third most frequently recorded species were noctules with a total of 39 passes, equating to 9% of all bat passes.
- 4.4.22 Serotine bats were recorded in low numbers in the north of the site. Long-eared bats and Myotis sp. were recorded in low numbers across the site.
- 4.4.23 Accounting for 54% of all bats passes recorded, the highest levels of bat activity was recorded by the detector placed in the south of the site (Ref: Figure 4d).
- 4.4.24 During the 30 minutes period after sunset 17 bat pass was recorded. The earliest recording was common pipistrelle at 20.08hrs (30 minutes prior to sunset) in the south of the site.
- 4.4.25 During the 30 minutes period prior to sunrise 36 bat passes were recorded. The latest recording was a common pipistrelle at 05:29hrs (8 minutes before sunrise) in the north of the site.

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## 5 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Elevated Tree Roost Inspection

- 5.1.1 The PEA identified the tree T2 as having features with potential to support roosting bats. The elevated tree roost inspection identified no polishing, droppings, staining or suitability to support bats and no further consideration to the presence of roosting bats within trees is required.

### 5.2 Bat Emergence

- 5.2.1 The structure B1 was identified as having 'Low' suitability for bats and two bat emergence surveys have been conducted over the 2018 and 2019 survey period.
- 5.2.2 As reasonable effort to determine the presence or likely absence of roosting bats within B1 has been applied and no bats or their roosts were recorded, no further consideration to the presence of bats within this structure is required.
- 5.2.3 In the unlikely event that bats, or their roosts are identified during the demolition process, all works should stop and the appointed ecologist or Natural England, be consulted on the appropriate manner in which to proceed.

### 5.3 Bat Activity

- 5.3.1 Bat transect surveys conducted to date conclude that although bat activity in the more built environs to the south is lowest, at least six species of bat are using the sites surrounding habitats for the purpose of foraging and commuting. With peak areas of activity being the bridge to the south of the site and the confluence of the Kennet and Thames, in order of frequency recorded across all surveys, the species recorded include common pipistrelle (41.08%), soprano pipistrelle (38.85%), Myotis sp. (12.20%), noctule (6.82%), long-eared bat (0.92%) and serotine (0.13%).
- 5.3.2 The surveys identified no rare or Annex II species and although difficult to quantify, the level of bat activity and bat species diversity identified throughout the surveys are considered 'Moderate'.
- 5.3.3 A marked spike in the number of bat passes recorded for common and soprano pipistrelle bats in May suggests a maternity roost for these species exists within proximity to the site.
- 5.3.4 Furthermore, the passes by soprano pipistrelle some 32 minutes before sunset in May, common pipistrelle some 30 minutes prior to sunset in June and August and a bat from the

genus *Myotis* some 15 minutes after sunset in July, indicates the presence of roosts for these species in close proximity to the site.

5.3.5 Although the majority of the static detector results were recorded along the northern railway boundary (no access for a walked transect were available along this boundary), the results from the walked transects identified bats using the river to the south for the purposes of both foraging and commuting. With key areas identified as that of the footbridge immediately to the south of the site and the confluence of the Kennet and Thames <200m east of the site, although analysis of the calls could not be conclusive; the habitat type, visual observation of bat morphology and the call parameters suggest at least some of the *Myotis* bats recorded along the Kennet were that of Daubenton's *M. daubentonii*. Comprising up to 25% of the total bat passes recorded, the number of passes by bats of the genus *Myotis* is notable and requires consideration. Although low in number, the presence of long-eared bats during both the static and walked transects confirm the use of the rail and river corridor by this species.

5.3.6 Although bats from the genus *Pipistrellus* and *Nyctalus* (noctule) are known to exhibit a low degree tolerance to artificial lights, many of the 18 species of bat identified within the UK are light sensitive and artificial lighting of bat roosts, access points and foraging pathways can be extremely disturbing to bats and should be avoided. Artificial light falling on or close to a bat roost can cause many problems for bats, by;

- delaying or preventing emergence from roosts, resulting in reduced foraging time and missing the peak time of insect abundance (just after dusk). As all bats in the UK feed on insects, this missed opportunity can have a serious impact on their survival and the growth rates of their young. In some cases leading to bats abandoning or becoming entombed in the roost when the entrance is lit up as bats will be less inclined to leave their roosts in these conditions. This is likely to be considered a breach of legislation as both bats and their roosts are protected by law.
- affecting the feeding behaviour of bats away from the roost. Slower flying species (long-eared bats and *Myotis* bats) avoid illuminated areas and therefore lose foraging grounds if they are lit. This results in slower flying species having to use poorer quality foraging sites and losing out on prey, which are attracted to the surrounding lit areas, a so called 'vacuum effect'.
- affecting commuting and foraging routes, which have been shown to be avoided if there is artificial light spill onto these areas.

- 5.3.7 Having identified light sensitive species present along both the river and rail corridor, to ensure the site remains suitable for use by bats, consideration to the potential impacts of the proposed development and its associated lighting strategy will be required.
- 5.3.8 Garland & Markham (2007) highlighted examples of brightly lit developments, as having potential to impact on bats as the lighting often comes on during the early evening when many bat species are becoming active. Furthermore, should the movement of bats along a commuting routes or foraging corridors be significantly inhibited by lighting, this would be considered a direct impact and would therefore constitute a disturbance offence under the Habitat Regulations 2018.
- 5.3.9 Although the schemes lighting plans have yet been finalised, in broad terms, without a lighting scheme that caters to the requirements of foraging and commuting bats, the development may result in the following impacts on bats:
- Severance of commuting routes;
  - Disruption of foraging areas;
  - Disturbance of potential roost sites.
- 5.3.10 To ensure the sites integrity for bats is maintained, any proposed lighting design should be considerate to the requirements set out by the Bat Conservation Trust in their 2018 document 'Bats and Artificial Lighting in the UK' (Bat Conservation Trust and the Institute of Lighting Professionals, 2018) and should implement the Dark Skies principal to lighting.
- 5.3.11 In accordance with this guidance, application of the following methods should be considerate to the reduction of the lighting impacts to a level suitable for use by bats:
- By forming a dark buffer zone to separate the site from the surrounding rail line and river corridor from lighting. This will include strategic planting of the associated boundaries with native tree and shrub species.
  - The omission of lighting unless required should be implemented across the site.
  - A lighting design that achieves 0.5lux or equals the existing lux levels (whichever is the greatest), at both ground and elevated levels, should be achieved along the northern and southern boundaries.
  - The inclusion of features such as hoods, cowls, louvres and shields on any lighting columns will direct light to the intended area, whilst avoiding unrequired light spillage.

- Luminaires should lack UV elements when manufactured and 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.
- Internal residential lighting should be achieved using LED downlighters (oppose pendants) which are to be set back from windows and balconies to prevent light spillage.
- Balconies should be positioned to maximise the 'shielding' effect of lighting from within living / communal spaces.
- The use of low transmittance glass should be considered where required.
- The use of specialist bollard or low-level downward directional luminaires should be utilised for external lighting.
- Column heights 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.
- Any external security lighting should be set on motion-sensors and short (1min) timers.
- Restricted timings (curfews) for the use of lights will ensure that even at reduced levels any detrimental effects of the required lighting are restricted to shortened periods during the active season for bats of April – November.
- Part night lighting of the site should be considered.
- Potential lighting impacts resulting from glazed windows within the proposed residential units should also be considered.
- The application of planning conditions / written agreements to ensure that no additional lighting is installed at a later date, will further secure the sites on-going use by bats.

5.3.12 When considering the above, should the remaining surveys confirm the presence of swarming/mating activity, the potential to include proportionate mitigation is high and this presence if unlikely to be prohibitive to development.

5.3.13 Its is suggested that so long as the above mitigation strategy is implemented in full, then the nearby roosts, flight lines and foraging areas identified within and around the site will be maintained and the development will be conducted in accordance with planning policies and legislation which serve to protect bats and their roosts.

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## 6 SUMMARY

- 6.1 In response to the proposed redevelopment of the site at SGN Gas Holder No.4, Reading, trees were subject to an elevated inspection, the building B1 was subject to a series of two evening emergence surveys and the site and surrounds were subject to bat activity surveys.
- 6.2 The tree T1 supports no features suitable for use by bats and no bats or their roosts were recorded within B1. No further consideration to the presence of roosting bats within the trees or structures is required.
- 6.3 Although yet to be complete, the bat activity surveys have identified activity indicative of common pipistrelle, soprano pipistrelle and bats of the Genus *Myotis* roosting in close proximity to the site. Furthermore, the northern rail and southern river corridor were both identified as important for foraging and commuting bats.
- 6.4 Without mitigation, lighting from the development has potential to impact on the suitability of these areas for bats. To be finalised upon completion of the surveys, methods to reduce lighting to suitable levels have been included within this report.
- 6.5 It is suggested that so long as the above recommendations are implemented in full, it is suggested that the works proposed at Reading SGN, will be conducted in accordance with current legislation and planning policies which serve to protect the sites, habitats and species likely to be impacted by the development.

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## 7 REFERENCES

A. J. Mitchell-Jones (2004). *Bat Mitigation Guidelines*. English Nature.

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

Greenspace Ecological Solutions (2018). *SGN Gas Holder No. 4, reading. Preliminary Ecological Appraisal*. Unpublished.

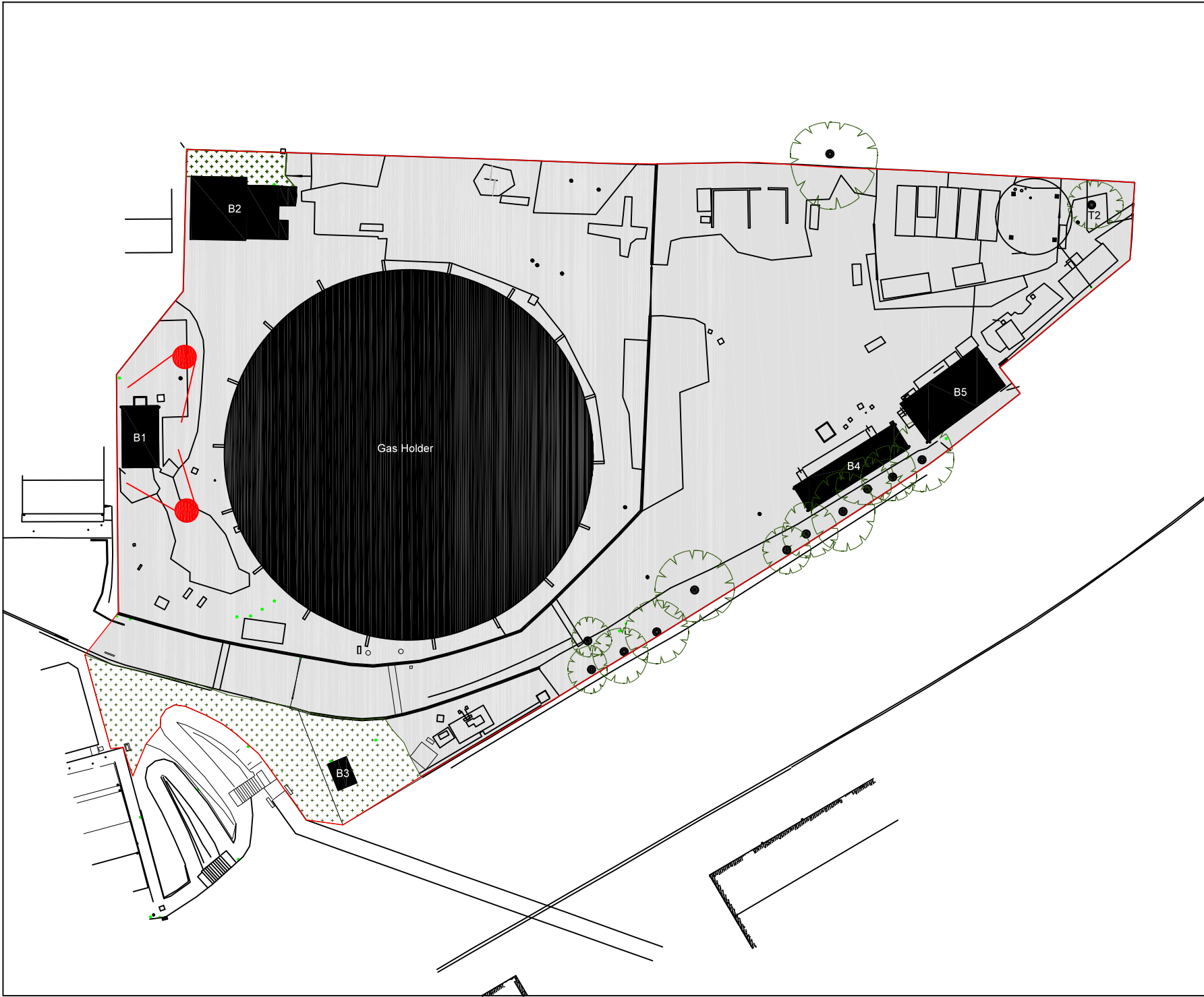
National Planning Policy Framework (NPPF) 2019  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/779764/NPPF\\_Feb\\_2019\\_web.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779764/NPPF_Feb_2019_web.pdf)

Natural Environment and Rural Communities (NERC) Act 2006.  
<http://www.legislation.gov.uk/ukpga/2006/16/contents>

The Conservation of Habitats and Species Regulations (Habitats Regulations) 2018.  
<http://www.legislation.gov.uk/uksi/2018/1307/contents/made>

Wildlife and Countryside Act (as amended) 1981. <http://jncc.defra.gov.uk/page-1377>

# Figures



Legend

-  Site Boundary
-  Surveyor Locations



Job Reference : J20563\_P4

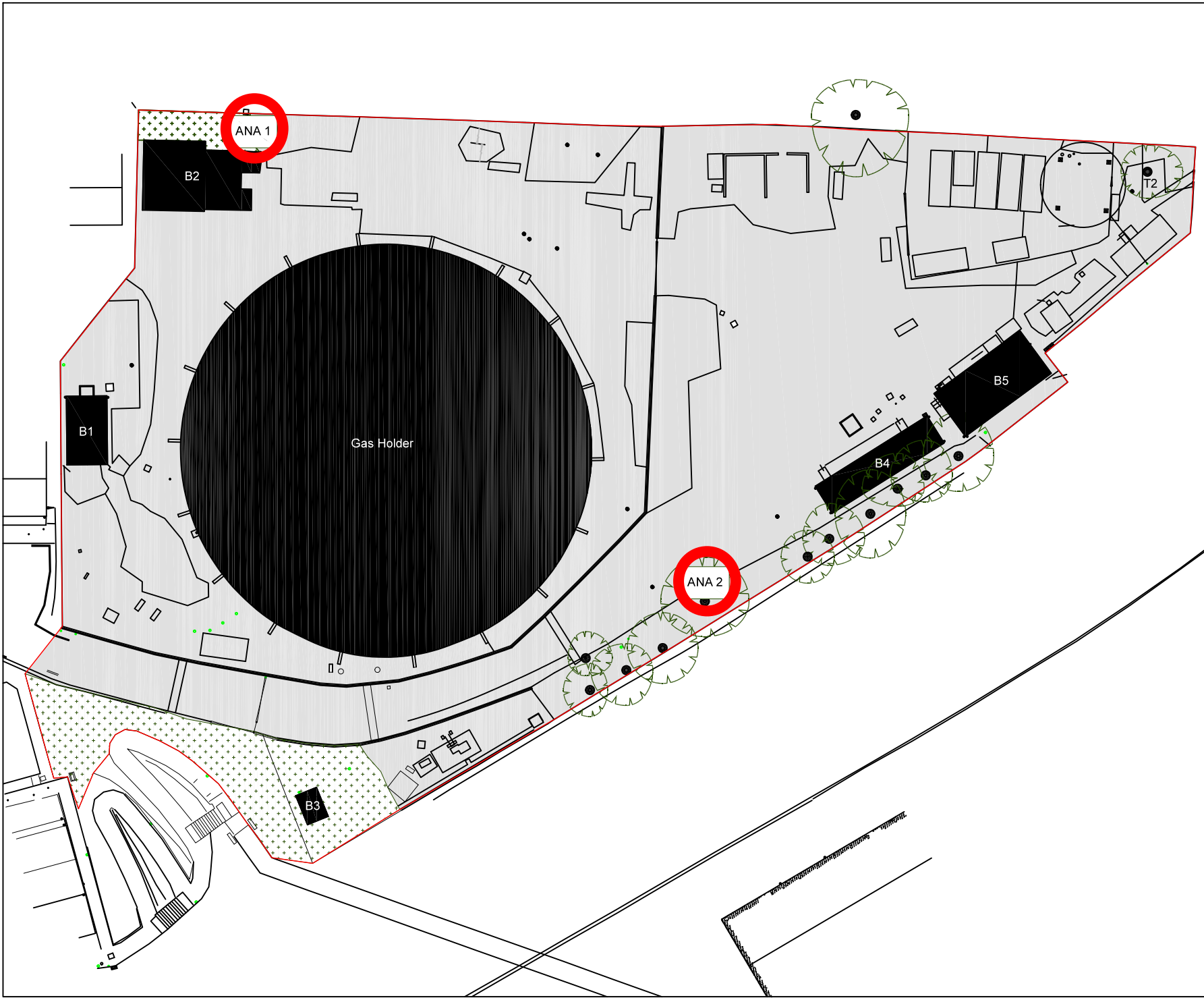
Project Title  
Reading SGN Site

Drawing Title  
Figure 1: Surveyor Locations

Date : 16-08-19      Checked : JJ

Drawn : GA      Approved : N/A

Status : Final      Scale : NTS



Legend

- Site Boundary
- Anabat Locations



Job Reference : J20563\_P4

Project Title  
Reading SGN Site

Drawing Title  
Figure 2: Anabat Locations

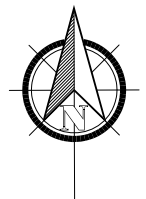
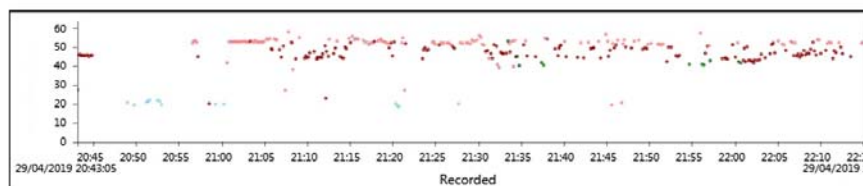
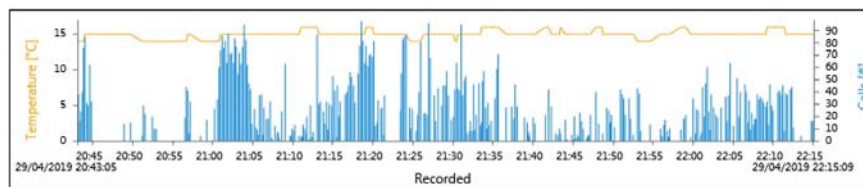
Date : 16-08-19      Checked : JJ

Drawn : GA      Approved : N/A

Status : Final      Scale : NTS



| Species                     | #   | # Calls |
|-----------------------------|-----|---------|
| ● Pipistrellus pipistrellus | 149 | 4245    |
| ● Nyctalus noctula          | 17  | 414     |
| ● Pipistrellus pygmaeus     | 121 | 4332    |
| ● Plecotus auritus          | 7   | 207     |
| ● Myotis spec.              | 12  | 206     |



Job Reference : J20563\_P4

Project Title: Reading SGN

Drawing Title  
Figure 3a - Transect Results (April 2019)

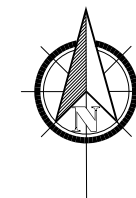
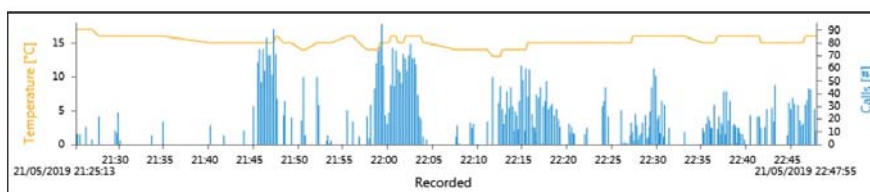
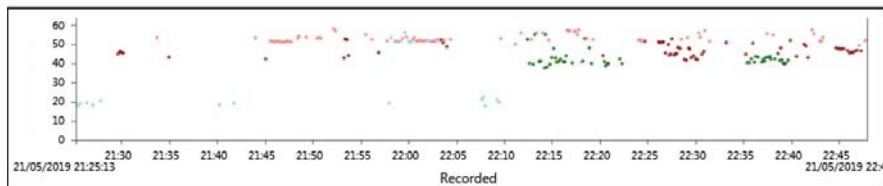
Date : 13-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



|                                    |    |      |
|------------------------------------|----|------|
| ● <i>Nyctalus noctula</i>          | 24 | 636  |
| ● <i>Myotis spec.</i>              | 54 | 1253 |
| ● <i>Pipistrellus pipistrellus</i> | 59 | 1050 |
| ● <i>Pipistrellus pygmaeus</i>     | 78 | 3046 |



Job Reference : J20563\_P4

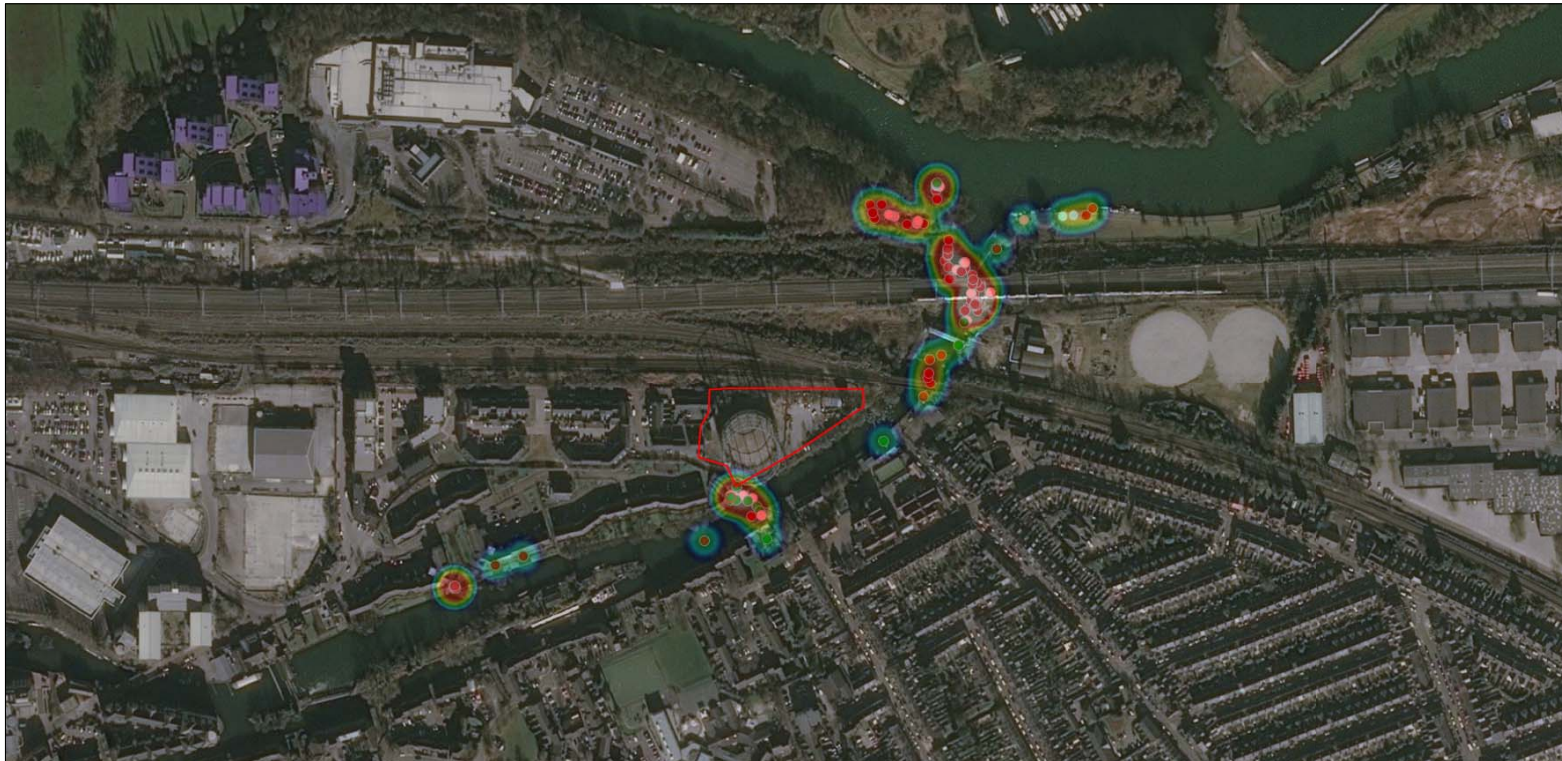
Project Title: Reading SGN

Drawing Title  
Figure 3b - Transect Results (May 2019)

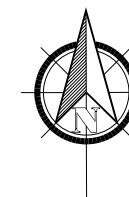
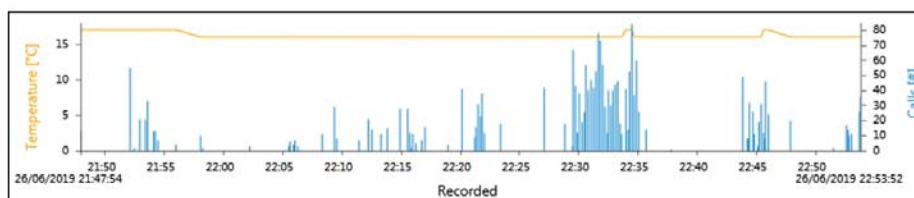
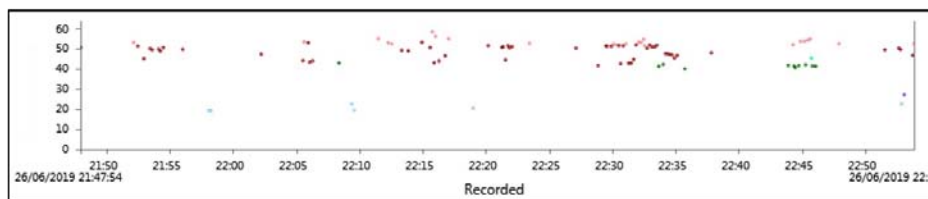
Date : 13-08-19      Checked : JJ

Drawn : GA      Approved : N/A

Status : Final      Scale : NTS



|                                    |    |      |
|------------------------------------|----|------|
| ● <i>Eptesicus serotinus</i>       | 1  | 11   |
| ● <i>Nyctalus noctula</i>          | 6  | 63   |
| ● <i>Myotis spec.</i>              | 12 | 289  |
| ● <i>Pipistrellus pygmaeus</i>     | 24 | 566  |
| ● <i>Pipistrellus pipistrellus</i> | 57 | 1436 |



Job Reference : J20563\_P4

Project Title: Reading SGN

Drawing Title  
Figure 3c - Transect Results (June 2019)

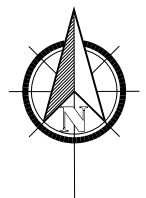
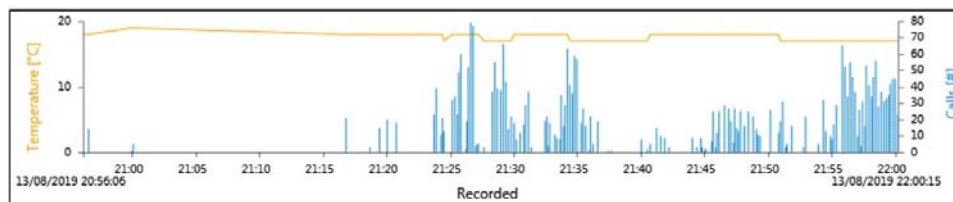
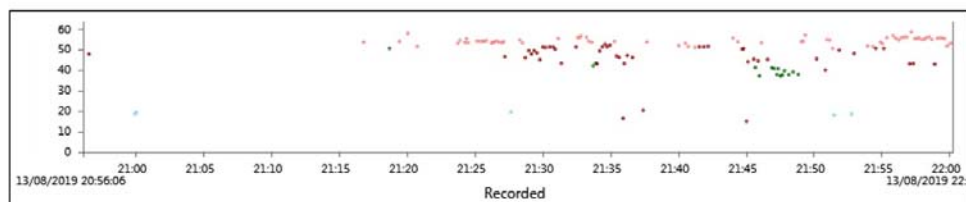
Date : 13-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



|                             |    |      |
|-----------------------------|----|------|
| ● Nyctalus noctula          | 5  | 17   |
| ● Myotis spec.              | 15 | 286  |
| ● Pipistrellus pipistrellus | 48 | 957  |
| ● Pipistrellus pygmaeus     | 73 | 1950 |



Job Reference : J20563\_P4

Project Title: Reading SGN

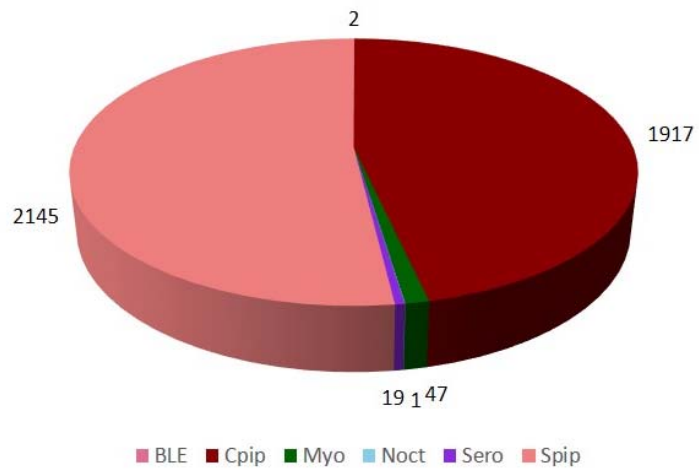
Drawing Title  
Figure 3d - Transect Results (August 2019)

Date : 15-08-19 Checked : JJ

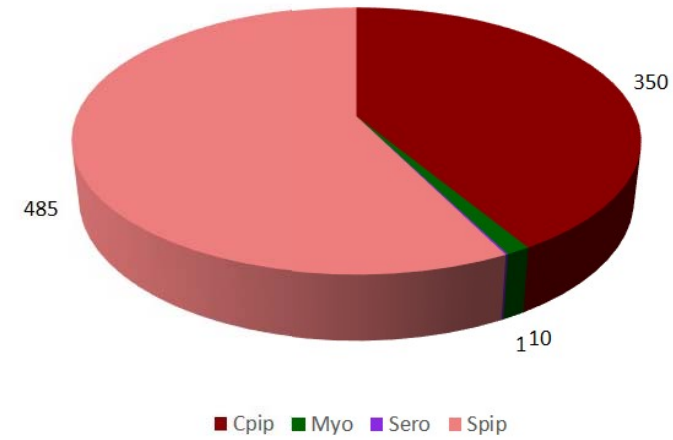
Drawn : GA Approved : N/A

Status : Final Scale : NTS

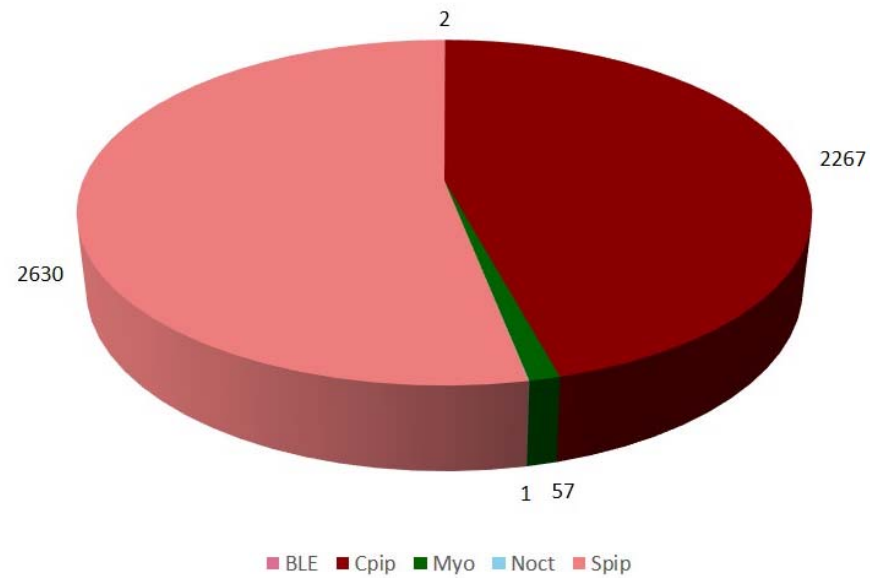
May 2019\_Anabat 1\_North



May 2019\_Anabat 2\_South



May 2019\_Combined Anabat Results



Job Reference : J20563\_P4

Project Title: Reading SGN

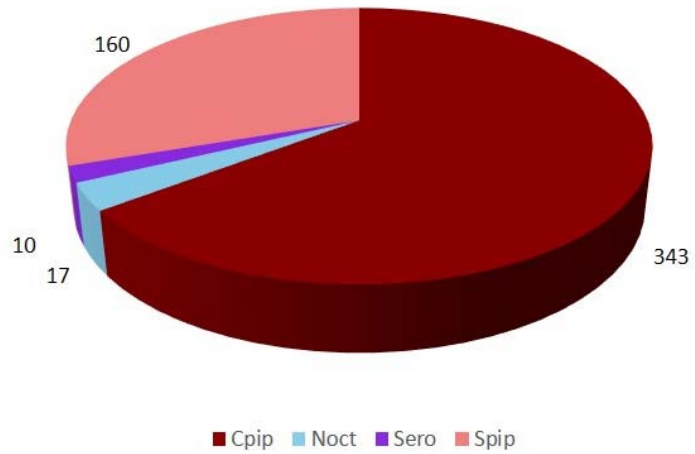
Drawing Title  
Figure 4a - Static Detector Results (May 2019)

Date : 12-08-19 Checked : JJ

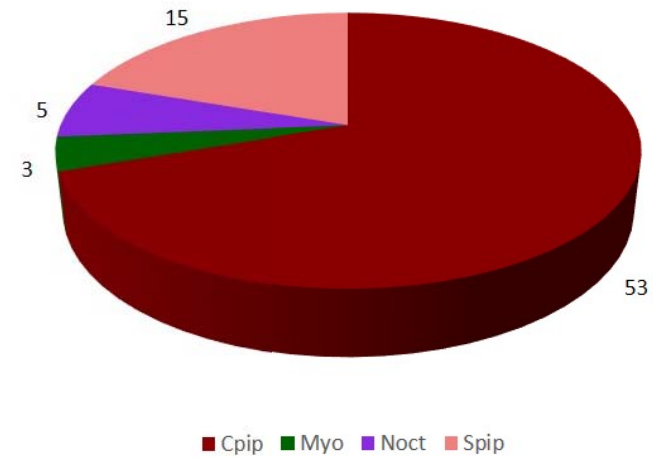
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Status : Final Scale : NTS

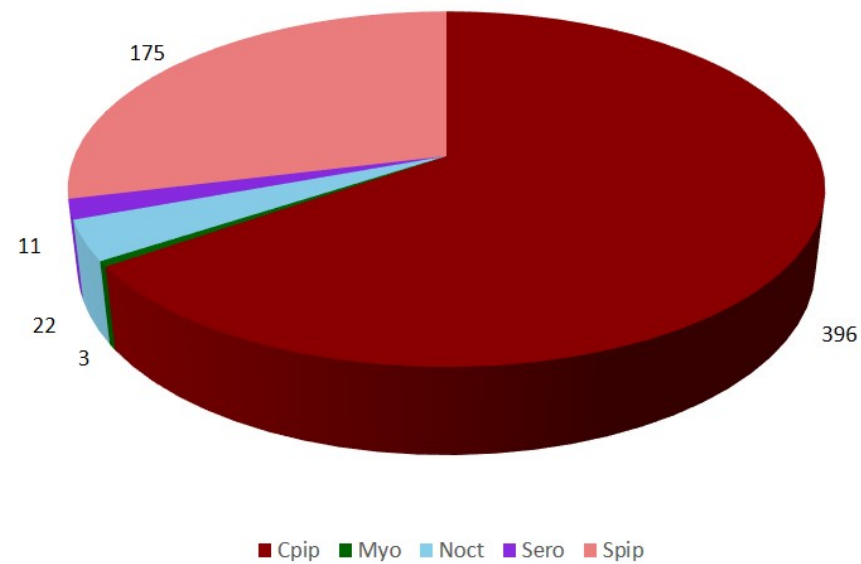
June 2019\_Anabat 1\_North



June 2019\_Anabat 2\_South



June 2019\_Combined Anabat Results



Job Reference : J20563\_P4

Project Title: Reading SGN

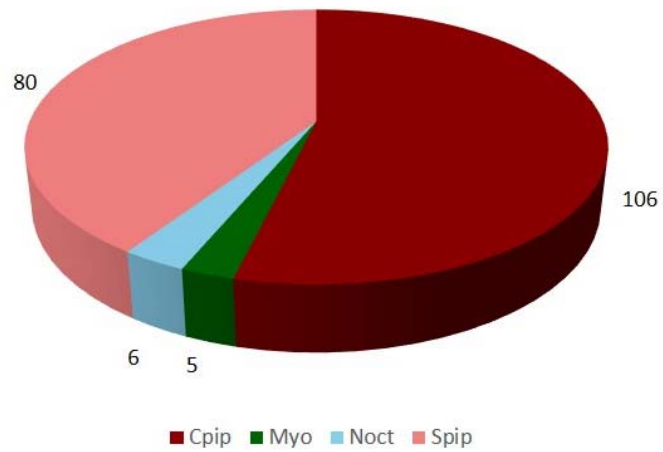
Drawing Title  
Figure 4b - Static Detector Results (June 2019)

Date : 12-08-19 Checked : JJ

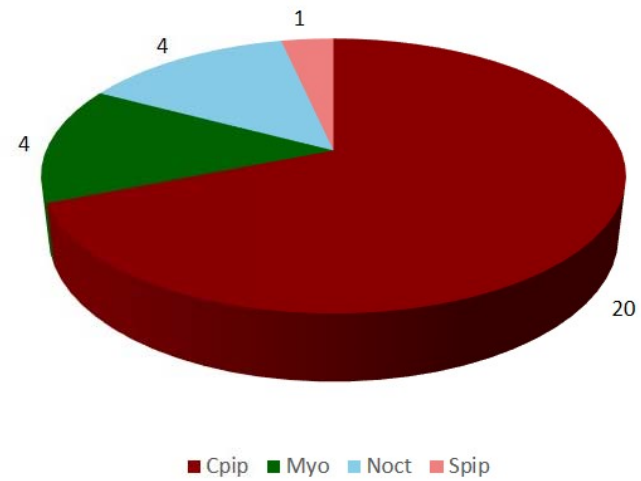
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Status : Final Scale : NTS

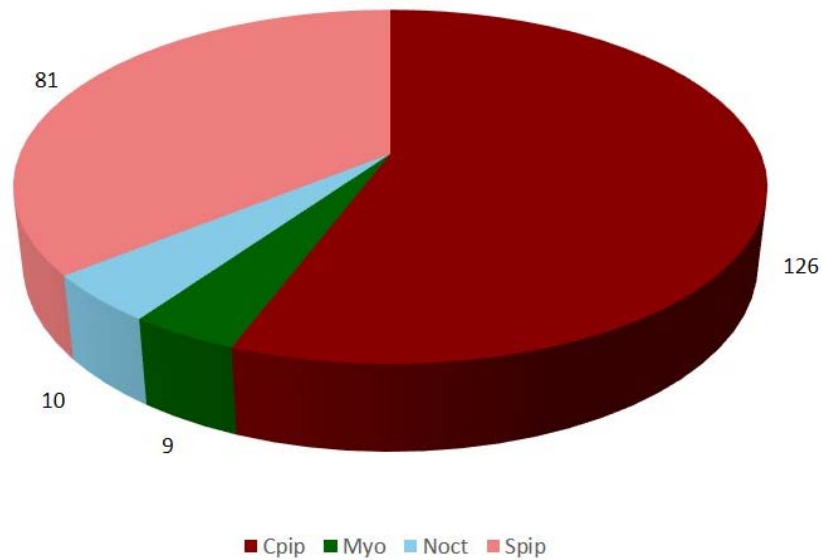
July 2019\_Anabat 1\_North



July 2019\_Anabat 2\_South



July 2019\_Combined Anabat Results



Job Reference : J20563\_P4

Project Title: Reading SGN

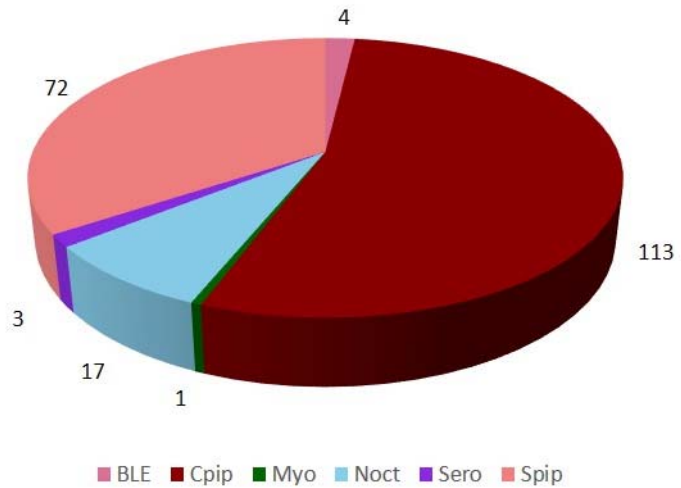
Drawing Title  
Figure 4c - Static Detector Results (July 2019)

Date : 12-08-19 Checked : JJ

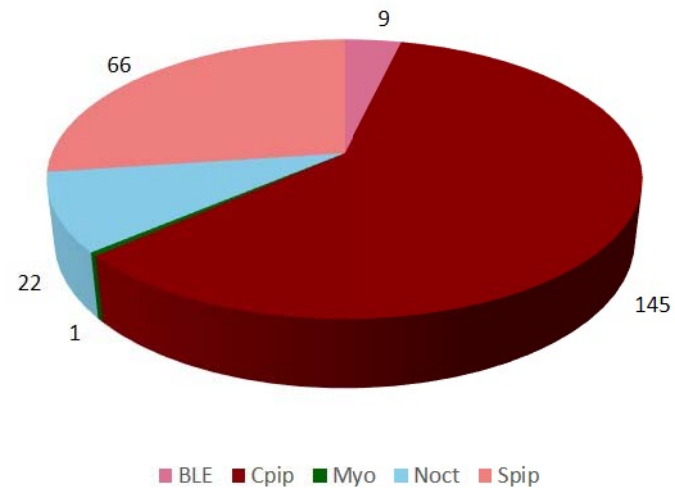
Drawn : GA Approved : N/A

Status : Final Scale : NTS

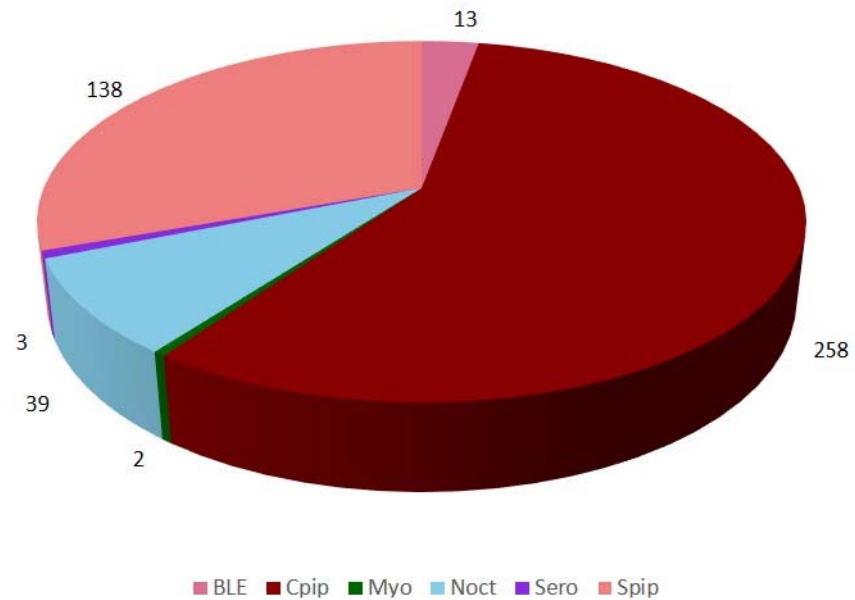
August 2019\_Anabat 1\_North



August 2019\_Anabat 2\_South



August 2019\_Combined Anabat Results



Job Reference : J20563\_P4

Project Title: Reading SGN

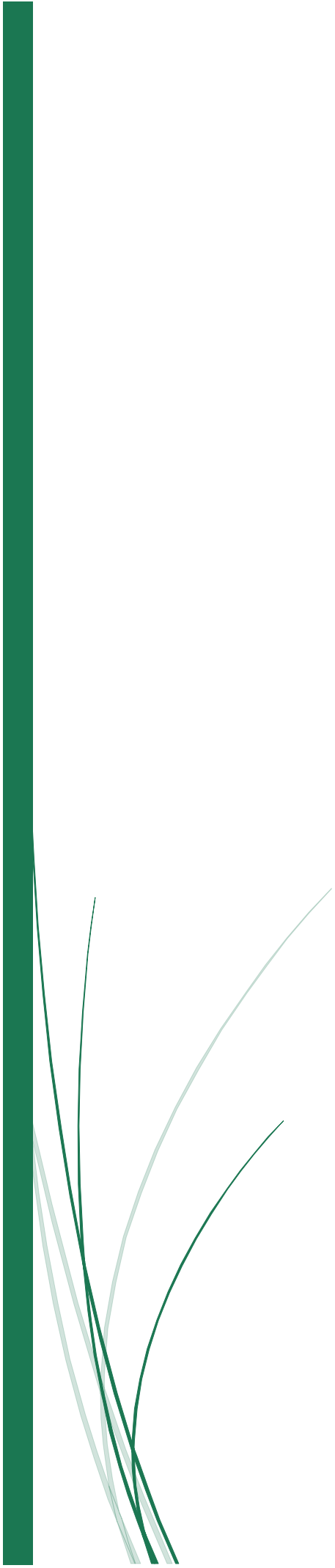
Drawing Title  
Figure 4d - Static Detector Results (August 2019)

Date : 12-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS

## Appendix D



# SGN Gas Holder No. 4 Reading

Bat Roost & Bat Activity Survey Report

A Report for Danescroft (Kenavon Drive  
Project Management) LLP

October 2019



[www.greenspace-ecology.co.uk](http://www.greenspace-ecology.co.uk)

[info@greenspace-ecology.co.uk](mailto:info@greenspace-ecology.co.uk)

# SGN Gas Holder No. 4, Reading

## Bat Roost & Bat Activity Survey Report

Controlled Copy

01 of 02

01 Danescroft (Kenavon Drive Project Management) LLP

02 Greenspace Ecological Solutions Ltd

Report Contributors: Gemma Abela and James Johnston ACIEEM

Proofread: Guy Newman MCIEEM

*The content of this report is the responsibility of Greenspace Ecological Solutions Ltd.  
It should be noted that whilst every effort has been made to meet the client's requirements, no site survey can ensure complete assessment or prediction of the changeable onsite environment. Furthermore, should more than 12 months elapse between the date of this survey and any subsequent development, it may be necessary to consider the need for an update survey to be undertaken.*

Report Number J20563\_P4

Greenspace Ecological Solutions Ltd.  
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Withyham, East Sussex,  
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Tel: 01892 457062

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[info@greenspace-ecology.co.uk](mailto:info@greenspace-ecology.co.uk)

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## 1 PROJECT OVERVIEW

Client: Danescroft (Kenavon Drive Project Management) LLP

Site Address: SGN Gas Holder No. 4, Kenavon Drive, Reading, Berkshire. RG1 3DH

Attending Ecologists: James Johnston (NE Bat Class 2 Licence)  
Joseph Dyson (NE Bat Class 1 Licence)  
Martin Rann Qualifying CIEEM  
Tanya Rowlinson Qualifying CIEEM  
Gemma Abela Qualifying CIEEM  
Mike Marriott

Survey Period: September 2018 – October 2019

Site Proposals: Redevelopment of an existing brownfield site to facilitate a new residential development with associated parking.

Associated Planning Reference Number: Not yet submitted.

Source of Relevant Documents:

| Document:         | Source:                                                                          |
|-------------------|----------------------------------------------------------------------------------|
| Previous Reports: | Preliminary Ecological Appraisal, Greenspace Ecological Solutions, October, 2018 |

---

## 2 INTRODUCTION

### 2.1 Context

2.1.1 In response to the redevelopment of the SGN Gas Holder No.4 Kenavon Drive, Reading, a Preliminary Ecological Appraisal (PEA) was undertaken by Greenspace Ecological Solutions Ltd (GES) in October 2018. Recommendations made within that report identified the need for further considerations in regard to bats. GES were subsequently commissioned to undertake an elevated tree roost assessment of a tree, bat roost presence/likely absence surveys of the building denoted B1 and bat activity surveys of the area surrounding the site.

2.1.2 The results of the surveys, as described in this report, serve to ensure that the Favourable Conservation Status (FCS) of bats is maintained throughout the development and that the proposals remain compliant with existing legislation and planning policies which serve to protect bats and their roosts. Where appropriate, proportionate mitigation to be incorporated within the design of the building, has been provided within this report.

### 2.2 Site Location

2.2.1 The site is located on the eastern edge of the town of Reading, Berkshire, at National Grid Reference SU 728 736.

### 2.3 Site Description

2.3.1 The site occupies approximately 0.71ha and comprises areas of scrub, scattered trees and buildings within areas of hard standing. A prominent gas holder is also present within the site.

2.3.2 The site is bound by residential dwellings to the west; the River Kennett to the south and east; and the National Rail link to the north. The wider landscape is typical of an urban area.

### 2.4 Policies and Legislation

2.4.1 The National Planning Policy Framework 2019 (NPPF) aims to protect species of significant conservation importance in England (in this case bats), as covered by wildlife legislation (see below), NPPF, national and local Biodiversity Action Plans (BAP's) and Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Local planning authorities have an obligation to protect such species and are also required to seek opportunities to promote and enhance biodiversity in accordance with the above legislation, policies and plans.

2.4.2 All British bat species and their places of rest and shelter receive UK and European protection under the Conservation of Habitats and Species Regulation 2018 (Habitats Regulations 2018)

and the Wildlife and Countryside Act (WCA) 1981 (as amended). This protection means that bats and their places of rest and shelter are a material consideration in the planning process.

2.4.3 Taken together, unless under licence, these make it an offence to:

- Deliberately capture or intentionally take a bat;
- Deliberately or intentionally kill or injure a bat;
- To be in possession or control of any live or dead bat or any part of, or anything derived from a bat;
- Damage or destroy a breeding site or resting place of a bat;
- Intentionally or recklessly obstruct access to any place that a bat uses for shelter or protection;
- Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection;
- Deliberately disturb any bat, in particular any disturbance which is likely to (i) impair their ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) to affect significantly the local distribution or abundance of the species to which they belong.
- A bat roost may be any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to use the same roost sites at different times of year, current legal opinion is that a bat roost is protected whether bats are present at the time.

2.4.4 In addition to the above, certain species of bat are listed on Annex II of the Habitat Regulations 2018. Annex II species include greater and lesser horseshoe bats, barbastelle and Bechstein's bat. Where present, consideration to the requirement of a Special Areas of Conservation (SAC) should be given.

## 2.5 Objectives of the Survey

2.5.1 The objectives of the surveys were to:

- Determine the presence of bats within the building and tree to be affected by the proposal,
- Gather baseline information on the species of bat using the site and adjacent habitats;
- Determine favoured foraging habitats and commuting routes that are likely to be affected by the proposed;

- Identify species, number and frequency of use of the site by bats should they be present;
- Evaluate the potential for bats to be affected by proposals;
- Identify legal or policy constraints related to bats that may affect the development; and
- Suggest mitigation/compensation measures that may be required.

## **2.6 Survey Constraints**

- 2.6.1 The results taken from bat detector recordings are biased towards bats that use louder echolocation calls. Therefore, quiet species such as long-eared bats may be under recorded due to the limited recording range of the equipment. To compensate for this, the surveyors remained vigilant to ensure that any visual cues identifying the presence of this species were accurately recorded.
- 2.6.2 It is difficult to confidently relate calls registered, to numbers of bats present. Therefore, the number of bat passes does not provide any indication of bat abundance; it is intended only to indicate the level of activity at a particular point.
- 2.6.3 During the walked transect on 18<sup>th</sup> July 2019, a kit failure resulted in a lack of recordings for the duration of the survey. The results for this section are therefore based on the field observations noted by the surveyor at the time of the survey.
- 2.6.4 Where identification is difficult to distinguish at an individual species level, bat passes are described to genus level such as *Myotis* sp., *Nyctalus* sp., *Pipistrellus* sp.

### 3 SURVEY METHODOLOGY

#### 3.1 Elevated Tree Roost Assessment

3.1.1 An elevated tree roost assessment was undertaken of T2 on the 17<sup>th</sup> July 2019 by licenced bat ecologist James Johnston.

3.1.2 The survey was completed in accordance with the guidelines set out by the Bat Conservation Trust (BCT) (Collins, 2016). Equipment used included a ladder and an endoscope. Suitable features identified during the ground level assessment were inspected for any evidence of bats and to determine their suitability for roosting bats.

#### 3.2 Bat Emergence Surveys

3.2.1 Dusk emergence surveys were undertaken of the on-site building denoted B1 on the 26<sup>th</sup> September 2018 and 17<sup>th</sup> July 2019. The survey was completed in accordance with current best practice guidance (Collins, 2016) and to adequately observe all aspects of the building, two surveyors were deployed during each survey. The location of the surveyors is depicted in Figure 1.

3.2.2 The survey was completed in favourable weather conditions with night-time temperatures of  $\geq 10^{\circ}\text{C}$  and little or no rain.

3.2.3 To account for the varying times in which differing bat species emerge, evening emergence surveys commenced 15 minutes before sunset and continued for 1 hour and 15 minutes after sunset, or until light levels deemed the survey no longer valid.

3.2.4 A summary of the weather conditions, surveyors and survey times recorded during the survey is provided in Table 1.

*Table 1 – Survey Times and Conditions*

| Date     | Sunset time | Start Time | End Time | Surveyors                       | Start Weather Conditions           | End Weather Conditions              |
|----------|-------------|------------|----------|---------------------------------|------------------------------------|-------------------------------------|
| 26/09/18 | 18:52       | 18:37      | 20:07    | James Johnston<br>Gemma Abela   | 17.0°C, 0% CC, no rain, wind 0BF   | 15.0°C, 0% CC, no rain, wind 0BF    |
| 17/07/19 | 21:12       | 20:57      | 22:27    | James Johnston<br>Mike Marriott | 18.0 °C, 98% CC, no rain, wind 2BF | 17.0 °C, 100% CC, no rain, wind 2BF |

3.2.5 To aid audible detection, surveyors were equipped with Elekon Batlogger M bat detectors. These detectors convert the inaudible echolocation of bats into a frequency audible to the

human ear. All calls were digitally recorded, and the sonograms later analysed through the application of the computer programme Elekon BatExplorer.

### 3.3 Bat Transect Surveys

- 3.3.1 The methodology for bat transect surveys follows the guidance set out by the Bat Conservation Trust (Collins, 2016). The primary objective of the transects were to identify foraging areas, commuting routes and species utilisation of the site.
- 3.3.2 To ensure coverage of the site, the transect routes were determined prior to the survey. To identify activity levels around the features of potential value to bats that are to be most affected by the proposals (i.e. hedgerows/tree lines/scrub habitats etc.) point count stops were included in strategic locations along the route. Each point count was 3 minutes long, during which time all bat activity was recorded. The Transect Route is depicted in Figure 3a.
- 3.3.3 The dusk transects commenced at and ran for a period of approximately 2hrs after sunset.
- 3.3.4 Each transect was walked at a steady pace with the species, time and behaviour of all bat passes recorded on a Site plan. The information gathered provides a general view of the bat activity present on Site and identifies the key foraging area and commuting routes. Elekon Batlogger M detectors were utilised, with the location of each call logged using the GPS facility provided within the unit.
- 3.3.5 Post-survey the peak frequency, inter-pulse interval, call duration and end frequency of the recorded bat calls were analysed using Bat Explorer. Analysis was undertaken by suitably experienced bat ecologists, with the level of bat species and activity across the site, in relation to the abundance of individual species foraging and commuting along the associated habitats, assessed accordingly.
- 3.3.6 All transects were undertaken in suitable weather conditions. A summary of the survey times, surveyors and weather conditions recorded during the surveys is provided in Table 2.

*Table 2 – Bat Transect Survey Conditions*

| Date     | Survey Start | Survey End | Sunset/Sunrise Time | Start Weather Conditions      | End Weather Conditions        | Surveyors                         |
|----------|--------------|------------|---------------------|-------------------------------|-------------------------------|-----------------------------------|
| 29/04/19 | 20:23        | 22:23      | 20:23               | 13.0°C, 78% CC, dry, wind OBF | 12.0°C, 90% CC, dry, wind OBF | Joseph Dyson<br>Tanya Rowlinson   |
| 21/05/18 | 20:57        | 22:47      | 20:57               | 17.0°C, 5% CC, dry, wind OBF  | 14.5°C, 0% CC, dry, wind OBF  | James Johnston<br>Tabitha Plummer |

|          |       |       |       |                                |                                       |                                  |
|----------|-------|-------|-------|--------------------------------|---------------------------------------|----------------------------------|
| 26/06/18 | 21:25 | 22:54 | 21:25 | 15.2°C, 100% CC, dry, wind OBF | 14.8°C, 0% CC, dry, wind OBF          | Martin Rann<br>Mike Marriott     |
| 18/07/19 | 03:07 | 05:00 | 05:07 | 14.0°C, 100% CC, dry, wind 1BF | 13.5°C, 100% CC, light rain, wind 1BF | James Johnston<br>Mike Marriott  |
| 13/08/19 | 20:31 | 22:00 | 21:20 | 20.5°C, 60% CC, dry, wind OBF  | 17.0°C, 80% CC, dry, wind OBF         | Martin Rann<br>Mike Marriott     |
| 11/09/19 | 19:28 | 21:28 | 19:28 | 20.4°C, 50% CC, dry, wind OBF  | 18.0°C, 50% CC, dry, wind OBF         | Tanya Rowlinson<br>Mike Marriott |
| 08/10/19 | 18:27 | 20:27 | 18:27 | 19.4°C, 20% CC, dry, wind OBF  | 11.7°C, 40% CC, dry, wind OBF         | Martin Rann<br>Mike Marriott     |

#### Bat Static Activity Survey

- 3.3.7 In conjunction with the transect surveys, two Anabat Express static bat detectors were deployed to gather data on bat activity within the site. The static detectors were deployed in strategic places within the site. In this instance, the detectors were deployed on the northern railway and southern river corridor boundaries. The location of the detectors was chosen to maximise coverage of the suitable habitats likely to be affected, directly or indirectly, by the proposed. These locations are depicted in Figure 2.
- 3.3.8 To account for the periods in which the lighting impacts are most likely to occur within the site, each static detector was programmed to record bat activity from ½ hr before sunset until ½ hr after sunrise during the periods 15<sup>th</sup> May – 19<sup>th</sup> May 2019, 21<sup>st</sup> June – 25<sup>th</sup> June 2019, 17<sup>th</sup> July – 21<sup>st</sup> July 2019, 8<sup>th</sup> August – 12<sup>th</sup> August 2019, 11<sup>th</sup> September – 15<sup>th</sup> September 2019 and 9<sup>th</sup> October – 13<sup>th</sup> October 2019. The sunset times during these periods were from 20:48hrs – 20h:54hrs, 21:24hrs – 21:24hrs, 21:12hrs – 21:08hrs, 20:40hrs – 20:32hrs, 19:28hrs – 19:19hrs and 18:24hrs – 18:15hrs, respectively. The sunrise times during these periods were from 05:12hrs – 05:07hrs, 04:46hrs – 04:47hrs, 05:06hrs – 05:11hrs, 05:37hrs – 05:44hrs, 06:31hrs – 06:38hrs and 07:17hrs – 07:23hrs respectively.
- 3.3.9 Upon completion of the data collection period, the static detectors were collected, and the data subsequently analysed using Analook.

## 4 SURVEY RESULTS

### 4.1 Elevated Tree Roost Inspection

- 4.1.1 The elevated inspection of the tree denoted T2 identified no evidence of use by bats and none of the features identified at ground level were considered suitable to support roosting bats.

### 4.2 Emergence Surveys

26th September 2018

- 4.2.1 No bats emerged from the building.
- 4.2.2 The first bat recorded during the survey was a common pipistrelle *Pipistrellus pipistrellus*, which was recorded foraging within the site at 19:37hrs, some 45 minutes after sunset.
- 4.2.3 This species, as well as soprano pipistrelle *P. pygmaeus* and noctule *Nyctalus noctula* were recorded in low numbers foraging within and commuting through the site during the survey.
- 4.2.4 Overall bat activity within the site was considered **Low**.

17<sup>th</sup> July 2019

- 4.2.5 No bats emerged from the building.
- 4.2.6 The first bat recorded was a common pipistrelle, which was recorded within the site at 21:27, some 17 minutes after sunset.
- 4.2.7 Common pipistrelle and soprano pipistrelle were recorded in low numbers foraging and commuting through the site during the survey.
- 4.2.8 Bat activity within the site was considered **Low**.

#### *Summary of Emergence Results*

- 4.2.9 Table 3 shows a summary of the survey results.

*Table 3. Emergence survey results summary*

| Date     | Bats emerging or returning from/to the building | Bat species recorded commuting / foraging within the site |
|----------|-------------------------------------------------|-----------------------------------------------------------|
| 26/09/18 | None                                            | Common pipistrelle<br>Soprano pipistrelle<br>Noctule      |
| 17/07/19 | None                                            | Common pipistrelle<br>Soprano pipistrelle                 |

### 4.3 Walked Transect Surveys

*29<sup>th</sup> April 2019*

- 4.3.1 The April transect recorded a total of 306 passes throughout the survey. As depicted in Figure 3a, the survey identified that 49% of bat passes were of common pipistrelle and 40% of bat passes were soprano pipistrelle. The remaining passes were of noctule (<6% of passes), *Myotis* sp. (<4% of passes) and long-eared bat (<2% of passes). Activity in April was considered high with peak activity recorded at the bridge to the south of the site and the confluence of the River Kennet and the River Thames.

*21<sup>st</sup> May 2019*

- 4.3.2 The May transect recorded a total of 215 passes throughout the survey. As depicted in Figure 3b, the survey identified that 36% of bat passes were of soprano pipistrelle and 27% of bat passes were common pipistrelle. The remaining passes were of *Myotis* sp. (25% of passes) and noctule (11% of passes). Activity in May was considered moderate with peak activity recorded at the bridge to the south of the site and the confluence of the River Kennet and the River Thames.

*26<sup>th</sup> June 2019*

- 4.3.3 The June transect recorded a total of 100 passes throughout the survey. As depicted in Figure 3c, the survey identified that 57% of bat passes were of common pipistrelle and 24% of bat passes were soprano pipistrelle. The remaining passes were of *Myotis* sp. (12% of passes), noctule (6% of passes) and serotine (1% of passes). Activity in June was considered low with peak activity recorded at the bridge to the south of the site, at the Network Rail link and the confluence of the River Kennet and the River Thames.

*18<sup>th</sup> July 2019*

- 4.3.4 Constrained due to equipment failure, the surveyor identified that most of the bat passes were common and soprano pipistrelle with some intermittent noctule passes. The July transect recorded a low/moderate level of bat activity during the survey. Several bats were recorded foraging and commuting along the length of transect route with peaks of activity recorded at the bridge to the south of the site and at the confluence of the River Kennet and the River Thames.

*13<sup>th</sup> August 2019*

- 4.3.5 The August transect recorded a total of 141 passes throughout the survey. As depicted in Figure 3d, the survey identified that 52% of bat passes were of soprano pipistrelle and 34% of bat passes were common pipistrelle. The remaining passes were of *Myotis* sp. (11% of passes)

and noctule (4% of passes). Activity in August was considered moderate with peak activity recorded at the bridge to the south of the site and at Network Rail link.

#### *11<sup>th</sup> September 2019*

- 4.3.6 The September transect recorded a total of 268 passes throughout the survey. As depicted in Figure 3e, the survey identified that 45% of bat passes were of common pipistrelle and 38% of bat passes were soprano pipistrelle. The remaining passes were of noctule (14% of passes) and *Myotis* sp. (2% of passes). Activity in September was considered high with peak activity recorded at the bridge to the south of the site and at the confluence of the River Kennet and the River Thames.

#### *8<sup>th</sup> October 2019*

- 4.3.7 The October transect recorded a total of 76 passes throughout the survey. As depicted in Figure 3f, the survey identified that 58% of bat passes were of common pipistrelle and 38% of bat passes were soprano pipistrelle. The remaining passes were of *Plecotus* sp. (4% of passes). Activity in October was considered low with peak activity recorded at the confluence of the River Kennet and the River Thames.

### **4.4 Static Surveys**

- 4.4.1 Static detector surveys have been carried out during the months of May – October 2019.

#### *15<sup>th</sup> May – 19<sup>th</sup> May 2019*

- 4.4.2 As detailed in Figure 4a, six species of bat (long-eared bat, common pipistrelle, *Myotis* sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the May survey.
- 4.4.3 The most frequently recorded species was soprano pipistrelle with a total of 2630 passes; 53% of all bat passes recorded across the site. The second most frequently recorded species was common pipistrelle with a total of 2267 passes, equating to 46% of all bat passes. The third most frequently recorded species were bats from the genus *Myotis* sp. with a total of 57 passes, equating to 1% of all bat passes.
- 4.4.4 Long-eared bats and noctule were recorded in low numbers in the south of the site only. Serotine bats were recorded in low numbers in both locations.
- 4.4.5 Accounting for 83% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed on the northern railway boundary of the site (Ref: Figure 4a).

4.4.6 During the 30 minutes period after sunset, 117 bat passes were recorded. The earliest recording was a soprano pipistrelle at 20:16hrs (32 minutes before sunset) in the south of the site.

4.4.7 During the 30 minutes period prior to sunrise, 12 bat passes were recorded. The latest recording was a common pipistrelle at 04:51hrs (18 minutes before sunrise) in the north of the site.

*21<sup>st</sup> June – 25<sup>th</sup> June 2019*

4.4.8 As detailed in Figure 4b, five species of bat (common pipistrelle, *Myotis* sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the June survey.

4.4.9 The most frequently recorded species was common pipistrelle with a total of 396 passes; 65% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 175 passes, equating to 29% of all bat passes. The third most frequently recorded species were bats were noctule with a total of 22 passes, equating to 4% of all bat passes.

4.4.10 *Myotis* sp. were recorded in low numbers in the south of the site only. Serotine bats were recorded in low numbers in both locations.

4.4.11 Accounting for 87% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed in the north of the site (Ref: Figure 4b).

4.4.12 During the 30 minutes period after sunset, 8 bat passes were recorded. The earliest recording was a common pipistrelle at 21:14hrs (10 minutes before sunset) in the south of the site.

4.4.13 During the 30 minutes period prior to sunrise, no bat passes were recorded. The latest recording was a soprano pipistrelle at 04:15hrs (31minutes before sunrise) in the north of the site.

*17<sup>th</sup> July – 21<sup>st</sup> July 2019*

4.4.14 As detailed in Figure 4c, four species of bat (common pipistrelle, *Myotis* sp., noctule and soprano pipistrelle) were recorded on the static detectors during the July survey.

4.4.15 The most frequently recorded species was common pipistrelle with a total of 126 passes; 56% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 81 passes, equating to 36% of all bat passes. The third most

frequently recorded species were noctule with a total of 10 passes, equating to 4% of all bat passes.

4.4.16 *Myotis* sp. were recorded in low numbers in both locations within the site.

4.4.17 Accounting for 87% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed in the north of the site (Ref: Figure 4c).

4.4.18 During the 30 minutes period after sunset, 1 bat pass was recorded. This recording was a *Myotis* sp. at 21.27hrs (15 minutes after sunset) in the north of the site.

4.4.19 During the 30 minutes period prior to sunrise, 5 bat passes were recorded. The latest recording was a common pipistrelle at 04:45hrs (26 minutes before sunrise) in the north of the site.

#### *8<sup>th</sup> August – 13<sup>th</sup> August 2019*

4.4.20 As detailed in Figure 4d, six species of bat (long-eared bat, common pipistrelle, *Myotis* sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the August survey.

4.4.21 The most frequently recorded species was common pipistrelle with a total of 258 passes; 57% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 138 passes, equating to 30% of all bat passes. The third most frequently recorded species were noctules with a total of 39 passes, equating to 9% of all bat passes.

4.4.22 Serotine bats were recorded in low numbers in the north of the site. Long-eared bats and *Myotis* sp. were recorded in low numbers across the site.

4.4.23 Accounting for 54% of all bats passes recorded, the highest levels of bat activity was recorded by the detector placed in the south of the site (Ref: Figure 4d).

4.4.24 During the 30 minutes period after sunset, 17 bat pass was recorded. The earliest recording was common pipistrelle at 20.08hrs (30 minutes prior to sunset) in the south of the site.

4.4.25 During the 30 minutes period prior to sunrise, 36 bat passes were recorded. The latest recording was a common pipistrelle at 05:29hrs (8 minutes before sunrise) in the north of the site.

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*11<sup>th</sup> September – 15<sup>th</sup> September 2019*

- 4.4.26 As detailed in Figure 4e, five species of bat (common pipistrelle, *Myotis* sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the September survey.
- 4.4.27 The most frequently recorded species was common pipistrelle with a total of 598 passes; 61% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 361 passes, equating to 37% of all bat passes. The third most frequently recorded species were noctules with a total of 20 passes, equating to 2% of all bat passes.
- 4.4.28 Serotine bats and *Myotis* sp. were recorded in low numbers in the north of the site, each equating to <1% of bat passes.
- 4.4.29 Accounting for 90% of all bats passes recorded, the highest levels of bat activity was recorded by the detector placed in the north of the site (Ref: Figure 4e).
- 4.4.30 During the 30 minutes period after sunset, 42 bat passes was recorded. The earliest recording was common pipistrelle at 19.40hrs (30 minutes prior to sunset) in the north of the site.
- 4.4.31 During the 30 minutes period prior to sunrise, 102 bat passes were recorded. The latest recording was a common pipistrelle at 06:24hrs (14 minutes before sunrise) in the south of the site.

*9<sup>th</sup> October – 13<sup>th</sup> October 2019*

- 4.4.32 As detailed in Figure 4f, five species of bat (common pipistrelle, *Myotis* sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the October survey.
- 4.4.33 The most frequently recorded species was common pipistrelle with a total of 46 passes; 48% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 43 passes, equating to 45% of all bat passes.
- 4.4.34 *Myotis* sp., noctule and serotine bats were recorded in low numbers, each equating to 2% of all bat passes. *Myotis* sp. was recorded in the north of the site, noctule was recorded in the south and serotine was detected across the site during the October survey.
- 4.4.35 Accounting for 76% of all bats passes recorded, the highest levels of bat activity was recorded by the detector placed in the south of the site (Ref: Figure 4f).
- 4.4.36 During the 30 minutes period after sunset, 12 bat passes was recorded. The earliest recording was common pipistrelle at 18.38hrs (16 minutes prior to sunset) in the south of the site.

- 4.4.37 During the 30 minutes period prior to sunrise, no bat passes were recorded. The latest recording was a common pipistrelle at 05:59hrs (42 minutes before sunrise) in the north of the site.

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## 5 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Elevated Tree Roost Inspection

- 5.1.1 The PEA identified the tree T2 as having features with potential to support roosting bats. The elevated tree roost inspection identified no polishing, droppings, staining or suitability to support bats and no further consideration to the presence of roosting bats within trees is required.

### 5.2 Bat Emergence

- 5.2.1 The structure B1 was identified as having 'Low' suitability for bats and two bat emergence surveys have been conducted over the 2018 and 2019 survey period.
- 5.2.2 As reasonable effort to determine the presence or likely absence of roosting bats within B1 has been applied and no bats or their roosts were recorded, no further consideration to the presence of bats within this structure is required.
- 5.2.3 In the unlikely event that bats, or their roosts are identified during the demolition process, all works should stop and the appointed ecologist or Natural England, be consulted on the appropriate manner in which to proceed.

### 5.3 Bat Activity

- 5.3.1 Bat transect surveys conducted conclude that although bat activity in the more built environs to the west is lowest, at least six species of bat are using the sites surrounding habitats for the purpose of foraging and commuting. With peak areas of activity being the bridge on the south west corner of the site and the confluence of the Kennet and Thames, in order of frequency across all surveys, the species recorded include common pipistrelle (50.19%), soprano pipistrelle (47.08%), noctule (1.08%), *Myotis* sp. (1.02%), long-eared bat (0.15%) and serotine (0.48%).
- 5.3.2 The surveys identified no rare or Annex II species and although difficult to quantify, the level of bat activity and bat species diversity identified throughout the surveys is considered 'Moderate'.
- 5.3.3 A marked spike in the number of bat passes recorded for common and soprano pipistrelle bats during the May surveys suggests a maternity roost for these species exists within close proximity to the site.

- 5.3.4 Furthermore, the passes by soprano pipistrelle some 32 minutes before sunset in May, common pipistrelle some 30 minutes prior to sunset in June and August and a bat from the genus *Myotis* some 15 minutes after sunset in July, indicates the presence of roosts for these species in close proximity to the site.
- 5.3.5 The results from the walked transects identified bats using the river to the south for the purposes of both foraging and commuting. With key areas identified being the stretch of river between the footbridge immediately to the south of the site and the railway bridge to the east; and the confluence of the Kennet and Thames <200m east of the site, although analysis of the calls could not be conclusive; the habitat type, visual observation of bat morphology and the call parameters suggest at least some of the *Myotis* bats recorded along the Kennet were that of Daubenton's *M. daubentonii*. Comprising up to 1% of the total bat passes recorded, the number of passes by bats of the genus *Myotis* is notable and requires consideration. Although low in number, the presence of long-eared bats during both the static and walked transects confirm the use of the rail and river corridor by this species.
- 5.3.6 Although bats from the genus *Pipistrellus* and *Nyctalus* (noctule) are known to exhibit a low degree of tolerance to artificial lights, many of the 18 species of bat identified within the UK are light sensitive and artificial lighting of bat roosts, access points and foraging pathways can be extremely disturbing to bats and should be avoided. Artificial light falling on or close to a bat roost can cause many problems for bats, by;
- delaying or preventing emergence from roosts, resulting in reduced foraging time and missing the peak time of insect abundance (just after dusk). As all bats in the UK feed on insects, this missed opportunity can have a serious impact on their survival and the growth rates of their young. In some cases, leading to bats abandoning or becoming entombed in the roost when the entrance is lit up as bats will be less inclined to leave their roosts in these conditions. This is likely to be considered a breach of legislation as both bats and their roosts are protected by law.
  - affecting the feeding behaviour of bats away from the roost. Slower flying species (long-eared bats and *Myotis* bats) avoid illuminated areas and therefore lose foraging grounds if they are lit. This results in slower flying species having to use poorer quality foraging sites and losing out on prey, which are attracted to the surrounding lit areas, a so called 'vacuum effect'.

- affecting commuting and foraging routes, which have been shown to be avoided if there is artificial light spill onto these areas.
- 5.3.7 Garland & Markham (2007) highlighted examples of brightly lit developments, as having potential to impact on bats as the lighting often comes on during the early evening when many bat species are becoming active. Furthermore, should the movement of bats along commuting routes or foraging corridors be significantly inhibited by lighting, this would be considered a direct impact and would therefore constitute a disturbance offence under the Habitat Regulations 2018.
- 5.3.8 Therefore, without a lighting scheme that caters to the requirements of foraging and commuting bats, the development may result in the following impacts on bats:
- Severance of commuting routes;
  - Disruption of foraging areas;
  - Disturbance of potential roost sites.
- 5.3.9 Having identified light sensitive species present along both the river and rail corridor, to ensure the site remains suitable for use by bats, consideration to the potential impacts of the proposed development and its associated lighting strategy has been given.

#### *During Construction*

- 5.3.10 To maintain the integrity of the surrounding bat habitats, a sensitive lighting scheme is to be implemented during the construction phase.
- 5.3.11 To limit potential lighting disturbance, lighting to facilitate the works will be directional and light spill onto vegetated habitats off-site will be avoided.
- 5.3.12 Where practical, works will be limited to standard daytime hours and where works are required outside of this period, suitable screening will be installed to avoid light spill onto the retained habitats. Installation of the screening will be conducted by the on-site contractors.
- 5.3.13 The appointed ecologist will assess the lighting units, the positioning of the lighting and the light spill resulting from the lighting units prior to the commencement of construction works or at the time of installation should work have commenced.

#### *Post Construction*

- 5.3.14 To ensure the sites integrity for bats has been maintained post construction, the lighting design strategy set out within Nick Smith Associates report (2019); has been designed

specifically to minimise lighting impacts on the associated river and rail corridor and has been compiled in accordance with the requirements set out by the Bat Conservation Trust (BCT) and the Institute of Lighting Professionals (ILP) [Guidance Note 08/18 Bats and artificial lighting in the UK](#). (2018).

5.3.15 In accordance with the guidance, application of the following methods has ensured the reduction of the lighting impacts has been reduced to a level suitable for use by bats:

- By forming a dark buffer zone to separate the site from the surrounding rail line and river corridor from lighting. This includes the strategic planting of a 2m high x 8m wide buffer of native tree and shrub species along the river bank.
- The omission of lighting unless required has been implemented across the site.
- The lighting scheme has been designed to achieve 1 lux at both ground and elevated levels, along at least half of the river corridor. (Nick Smith Associates (NSA) - *Drawings 2569-D\_02 and 03 rev A*).
- Internal residential lighting is to be achieved using LED downlighters (oppose pendants) which are to be set back from windows and balconies to prevent light spillage.
- Balconies have been positioned to maximise the 'shielding' effect of lighting from within living / communal spaces.
- External column heights restricted to 5m in car parking area.
- The use of specialist bollard and handle rail lighting used in the other public areas of the site.

5.3.16 As long as the above mitigation strategy is implemented in full, the nearby roosts, flight lines and foraging areas identified within and around the site will be maintained and the development will be conducted in accordance with planning policies and legislation which serve to protect bats and their roosts.

5.3.17 The lighting impacts demonstrated within the NSA report are given as a worst-case scenario and in isolation, development of the site results in little increase to the existing light levels. However, to achieve further enhancement for bats the following points have been identified, modelled and demonstrated as viable within the design:

- A significant reduction in the existing lighting impacts on the Kennet River Corridor from roadside lighting on the opposite southern side of the river, could be achieved through revision / replacement of the existing off-site lighting units. In the location of the proposed development, replacement of these units would lower the lux levels to <0.4 lux across the

entirety of the water course. Further details of this strategy are set out within the NSA report (2019). For clarity; the existing and proposed lux level lighting plans are depicted in Figure 5 and 6 respectively.

- Allowing the vegetation within the on-site green buffer along the river corridor to grow to a height of 5m+ would provide a robust flight-line for bats and further reduce the lux levels on the river.
- The installation of floating ecosystem riverbanks such as those provided by [Biomatrix Water](#) along the site side bank of the River Kennet would provide a source of flowering plants for invertebrates (bat prey items) and also provide extra vegetation lines for commuting bats.

5.3.18 It should also be noted, that these recommendations are provided in addition to the wildlife friendly planting strategies, integrated bat boxes to be included within the proposed buildings and alternate measures to achieve biodiversity net gain, as set out within the alternate ecology reports.

5.3.19 It is, there, suggested that through application of the above and alternately proposed mitigation strategies, development of the site will serve to significantly increase the Site and adjacent River Kennet Corridor in its suitability to support even the more light sensitive species of bat.

## 6 SUMMARY

- 6.1 In response to the proposed redevelopment of the site at SGN Gas Holder No.4, Reading; the tree T2 was subject to an elevated inspection, the building B1 was subject to a series of two evening emergence surveys and the site and surrounds were subject to bat activity surveys.
- 6.2 The tree T2 supports no features suitable for use by bats and no bats or their roosts were recorded within B1. No further consideration to the presence of roosting bats within the trees or structures is required.
- 6.3 The bat activity surveys identified common pipistrelle, soprano pipistrelle and bats of the genus *Myotis* roosting in close proximity to the site. Furthermore, the northern rail and southern river corridor were both identified as important for foraging and commuting bats.
- 6.4 Without mitigation, lighting from the development had the potential to impact on the suitability of these areas for bats. Working collaboratively with the appointed lighting engineer, the lighting scheme proposed serves to result in minimal and acceptable levels of increased lighting through on-site mitigation, and opportunity to significantly reduce lighting impacts on the river corridor through off-site lighting alterations.
- 6.5 In addition to wildlife friendly landscaping, integrated bat boxes and wider measures to achieve biodiversity net gain within the proposed development, measures inclusive of floating eco systems and an increase in the height of on-site vegetation will further enhance the areas use for wildlife.
- 6.6 It is suggested that so long as the above recommendations are implemented in full, the proposed development will not only be conducted in accordance with current legislation and planning policies which serve to protect habitats and species of conservation importance, but will serve to provide significant enhancements for not only bats, but also the adjacent river Kennet corridor and the species which depend upon it.

## 7 REFERENCES

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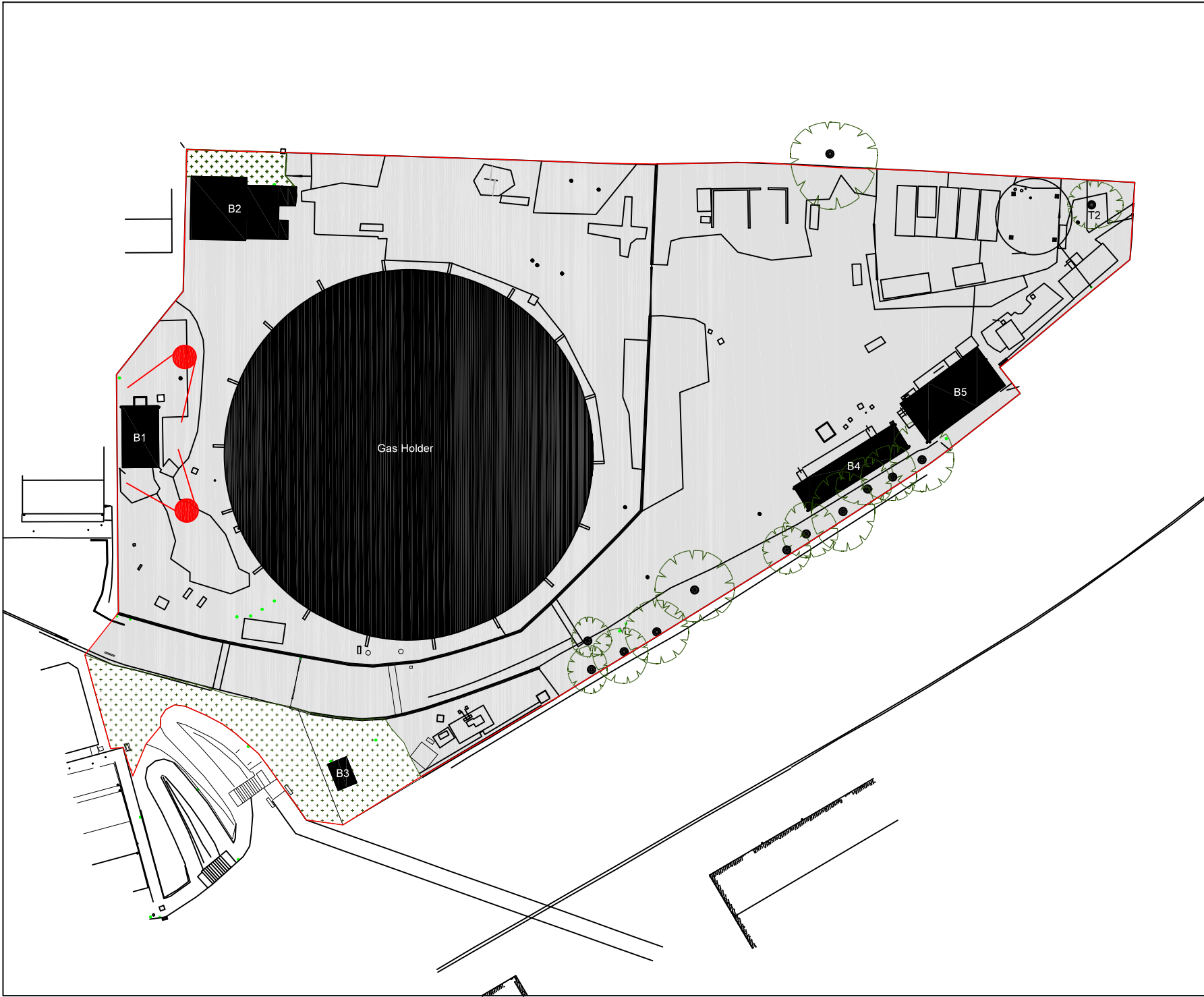
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The Conservation of Habitats and Species Regulations (Habitats Regulations) 2017.  
<http://www.legislation.gov.uk/uksi/2017/1012/made>

Wildlife and Countryside Act (as amended) 1981. <http://jncc.defra.gov.uk/page-1377>

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# Figures



Legend

-  Site Boundary
-  Surveyor Locations



Job Reference : J20563\_P4

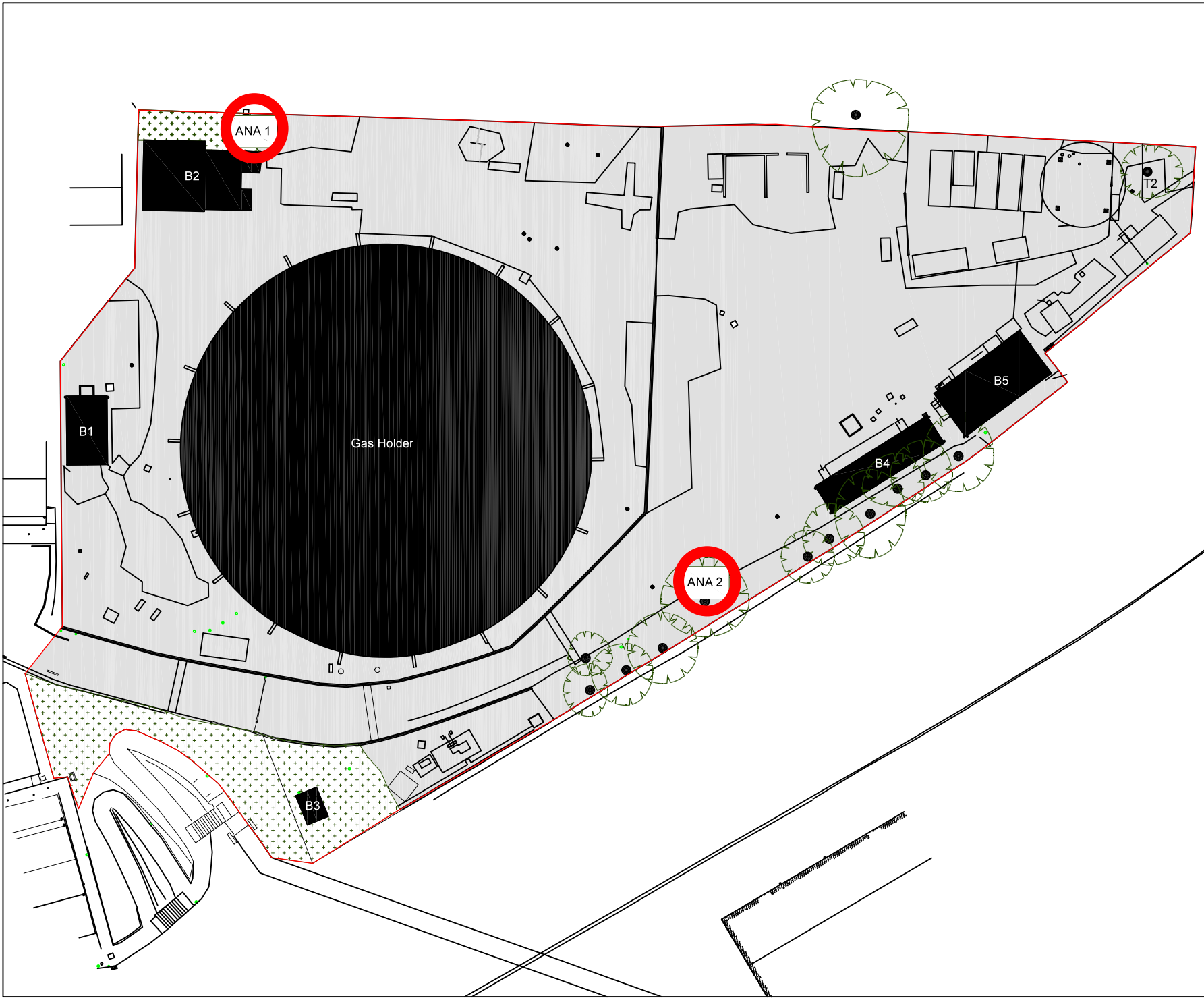
Project Title  
Reading SGN Site

Drawing Title  
Figure 1: Surveyor Locations

Date : 16-08-19      Checked : JJ

Drawn : GA      Approved : N/A

Status : Final      Scale : NTS



Legend

- Site Boundary
- Anabat Locations



Job Reference : J20563\_P4

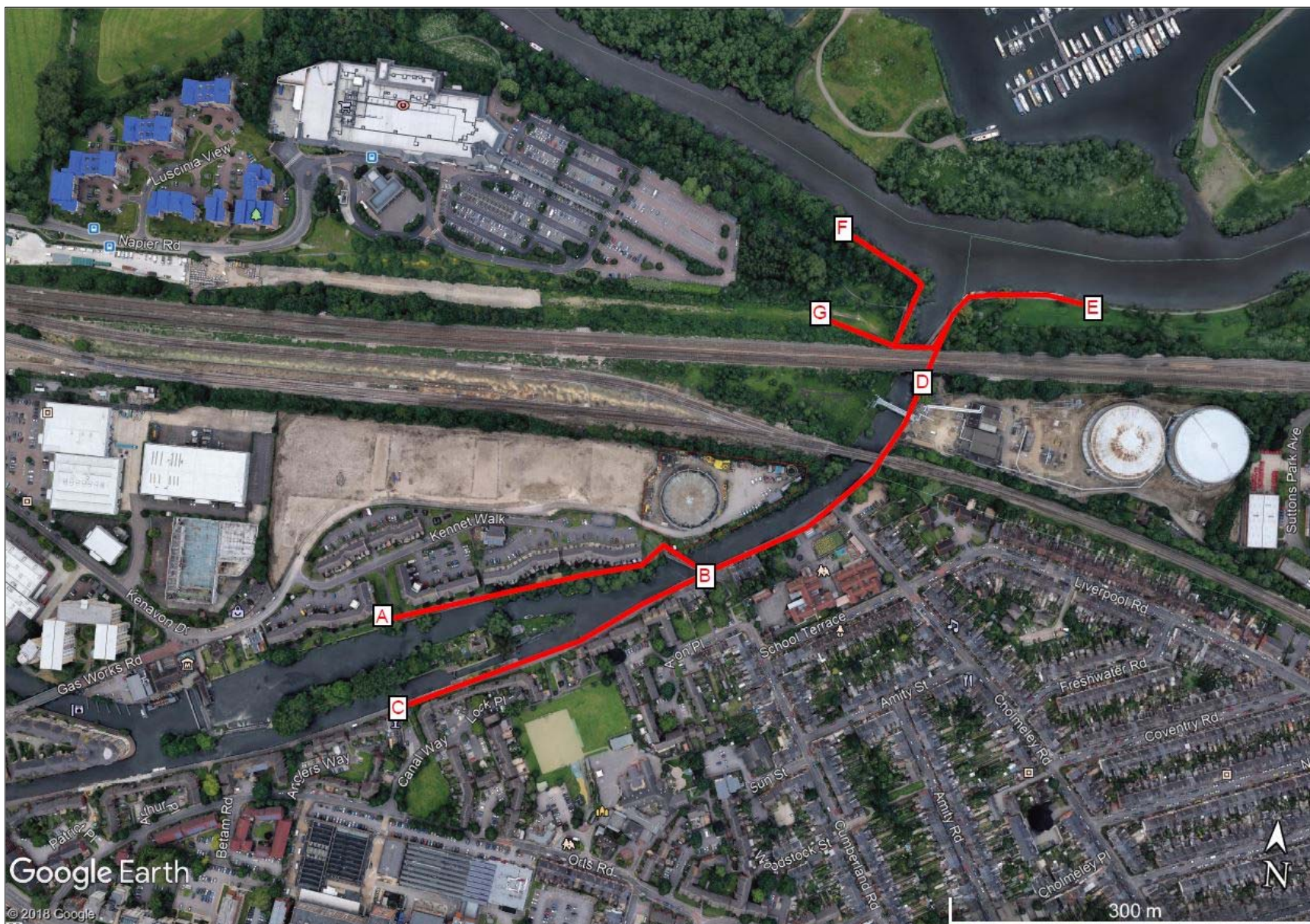
Project Title  
Reading SGN Site

Drawing Title  
Figure 2: Anabat Locations

Date : 16-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



## Legend

- Transect Route
- Point Count Stop



Job Reference : J20563\_P4

Project Title: Reading SGN

Drawing Title  
Figure 3a - Transect Route

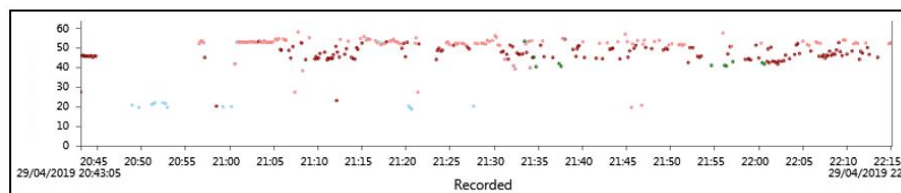
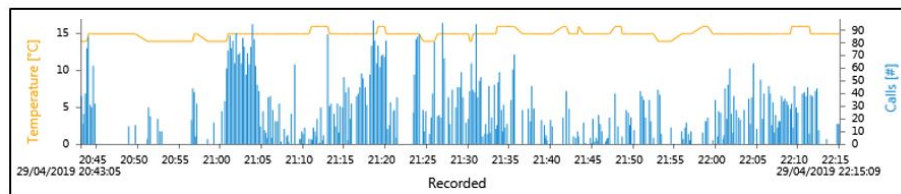
Date : 09-09-19      Checked : JJ

Drawn : GA      Approved : N/A

Status : Final      Scale : NTS



| Species                     | #   | # Calls |
|-----------------------------|-----|---------|
| ● Pipistrellus pipistrellus | 149 | 4245    |
| ● Nyctalus noctula          | 17  | 414     |
| ● Pipistrellus pygmaeus     | 121 | 4332    |
| ● Plecotus auritus          | 7   | 207     |
| ● Myotis spec.              | 12  | 206     |



Job Reference : J20563\_P4

Project Title: Reading SGN

Drawing Title  
Figure 3b - Transect Results (April 2019)

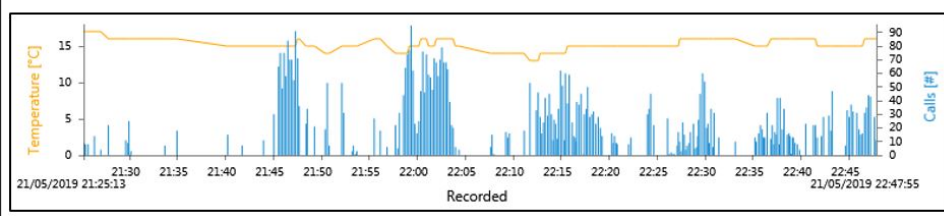
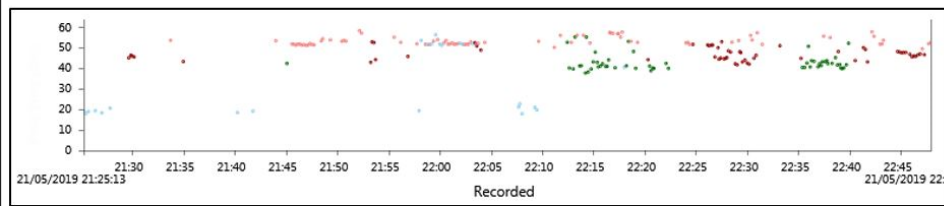
Date : 13-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



| Species                   | #  | Calls |
|---------------------------|----|-------|
| Nyctalus noctula          | 24 | 636   |
| Myotis spec.              | 54 | 1253  |
| Pipistrellus pipistrellus | 59 | 1050  |
| Pipistrellus pygmaeus     | 78 | 3046  |



Job Reference : J20563\_P4

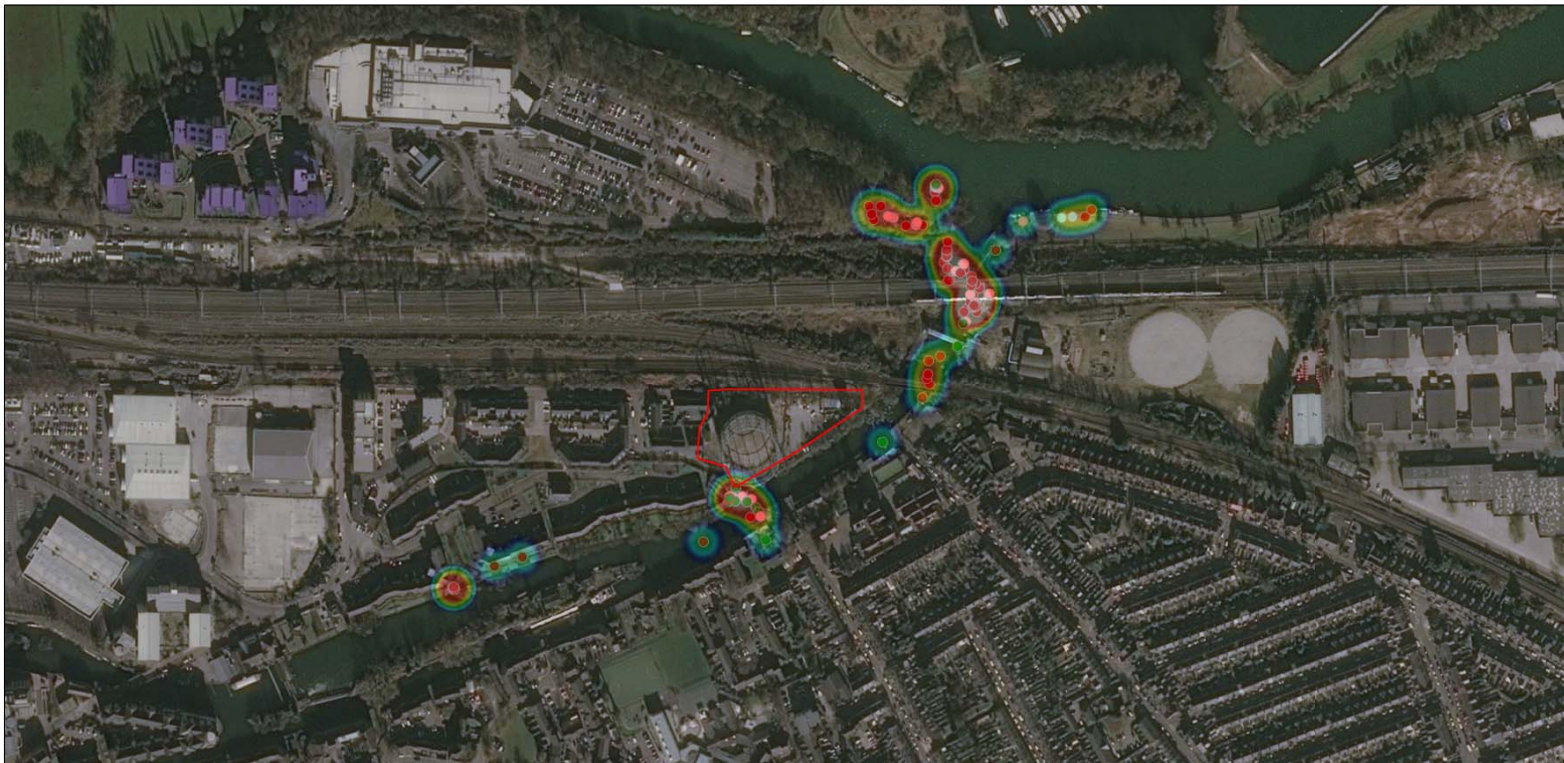
Project Title: Reading SGN

Drawing Title  
Figure 3c - Transect Results (May 2019)

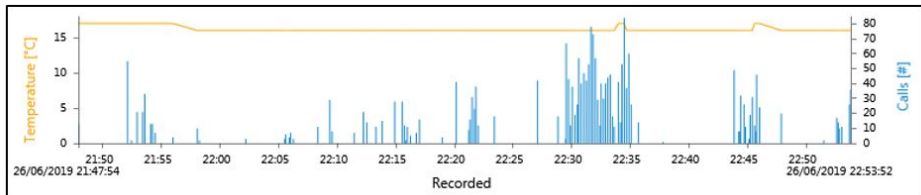
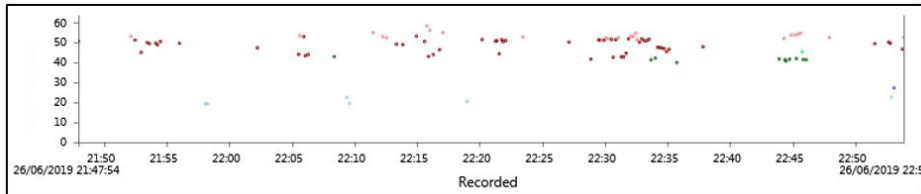
Date : 13-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



| Species                            | #  | Calls |
|------------------------------------|----|-------|
| ● <i>Eptesicus serotinus</i>       | 1  | 11    |
| ● <i>Nyctalus noctula</i>          | 6  | 63    |
| ● <i>Myotis spec.</i>              | 12 | 289   |
| ● <i>Pipistrellus pygmaeus</i>     | 24 | 566   |
| ● <i>Pipistrellus pipistrellus</i> | 57 | 1436  |



Job Reference : J20563\_P4

Project Title: Reading SGN

Drawing Title  
Figure 3d - Transect Results (June 2019)

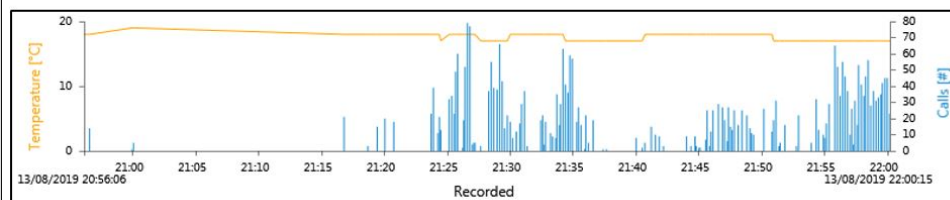
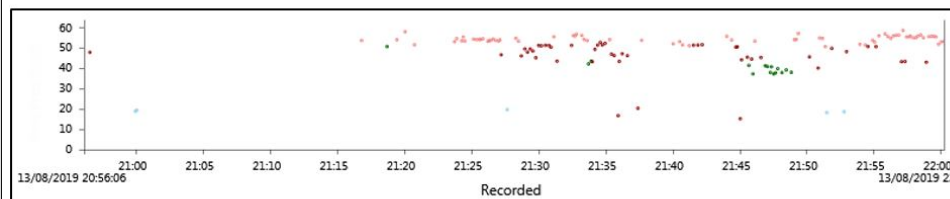
Date : 13-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



| Species                            | #  | Calls |
|------------------------------------|----|-------|
| ● <i>Nyctalus noctula</i>          | 5  | 17    |
| ● <i>Myotis spec.</i>              | 15 | 286   |
| ● <i>Pipistrellus pipistrellus</i> | 48 | 957   |
| ● <i>Pipistrellus pygmaeus</i>     | 73 | 1950  |



Job Reference : J20563\_P4

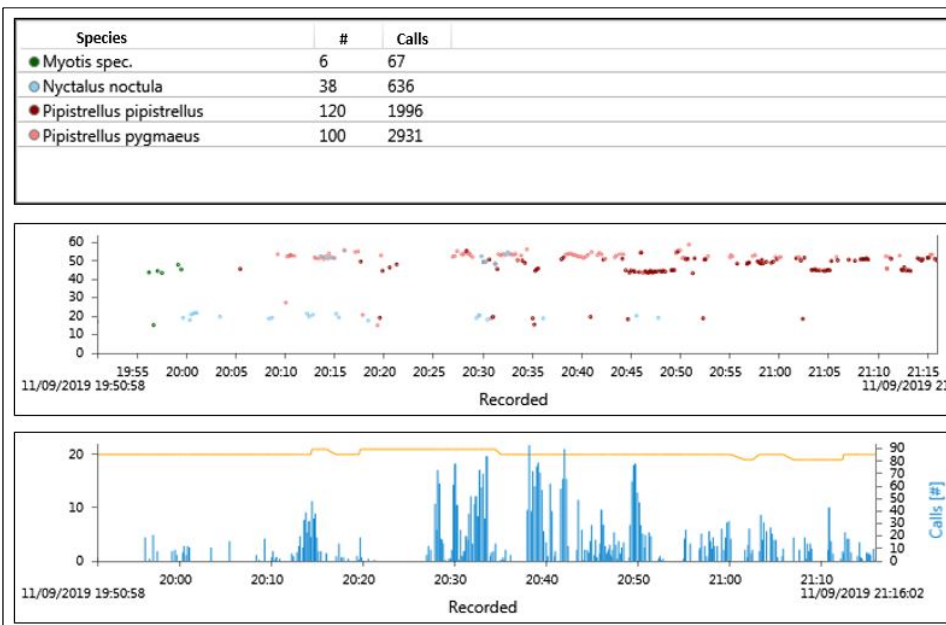
Project Title: Reading SGN

Drawing Title  
Figure 3e - Transect Results (August 2019)

Date : 15-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



Job Reference : J20563\_P4

Project Title: Reading SGN

Drawing Title  
Figure 3f - Transect Results (September 2019)

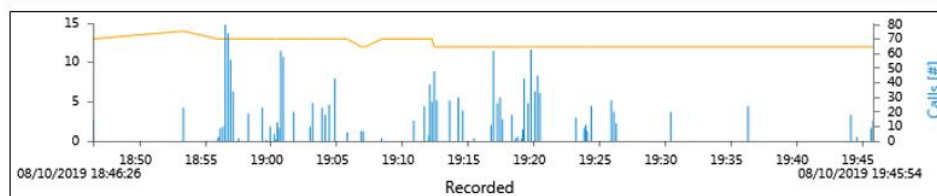
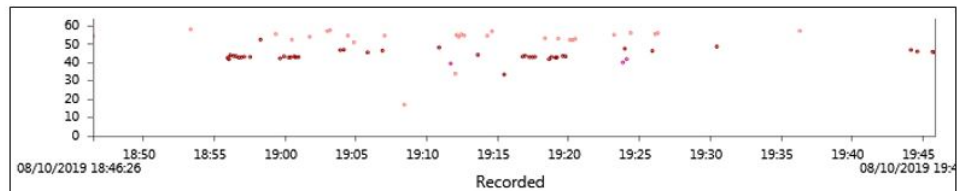
Date : 15-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



| Species                     | #  | Calls |
|-----------------------------|----|-------|
| ● Pipistrellus pipistrellus | 44 | 884   |
| ● Pipistrellus pygmaeus     | 29 | 673   |
| ● Plecotus spec.            | 3  | 40    |



Job Reference : J20563\_P4

Project Title: Reading SGN

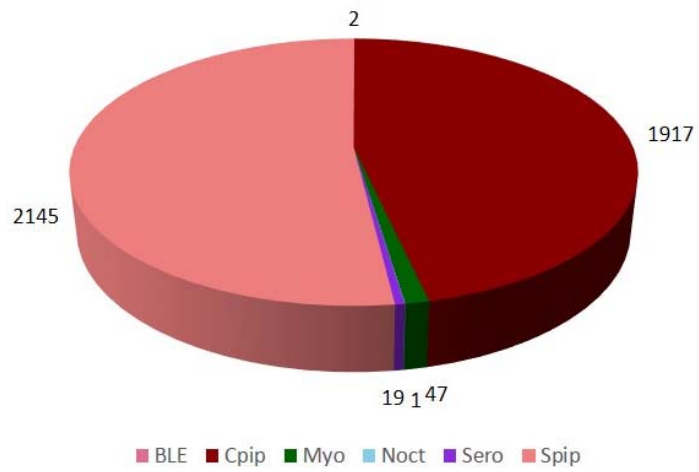
Drawing Title  
Figure 3g - Transect Results (October 2019)

Date : 14-10-19 Checked : JJ

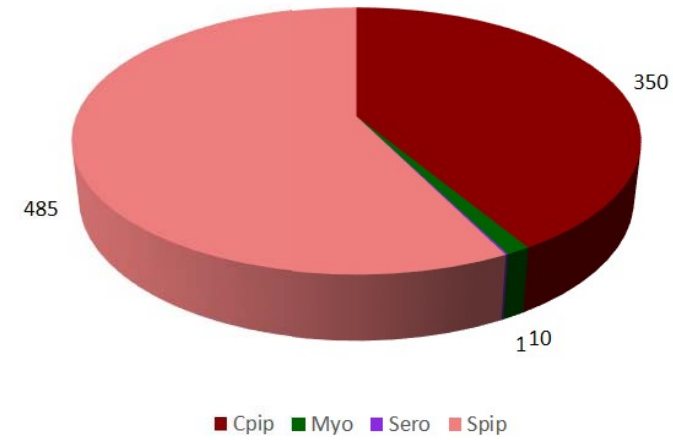
Drawn : GA Approved : N/A

Status : Final Scale : NTS

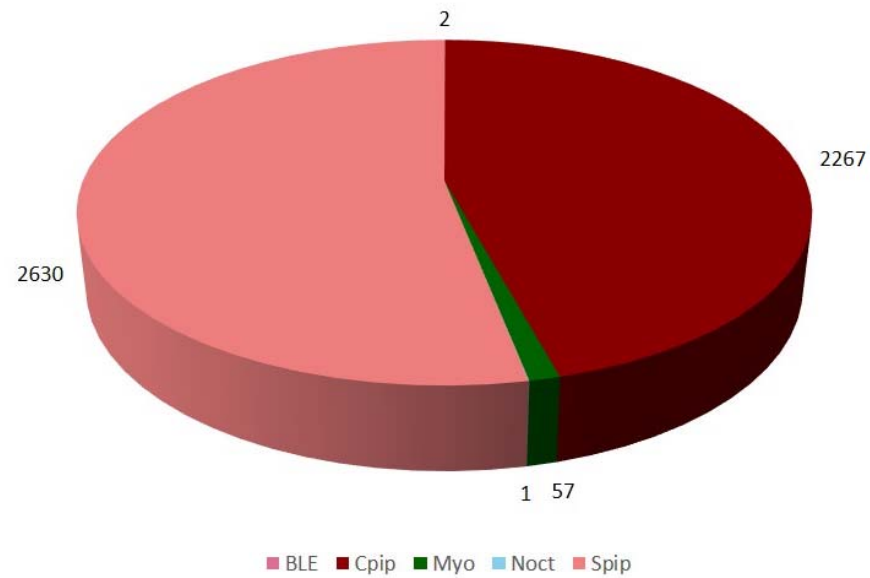
May 2019\_Anabat 1\_North



May 2019\_Anabat 2\_South



May 2019\_Combined Anabat Results



Job Reference : J20563\_P4

Project Title: Reading SGN

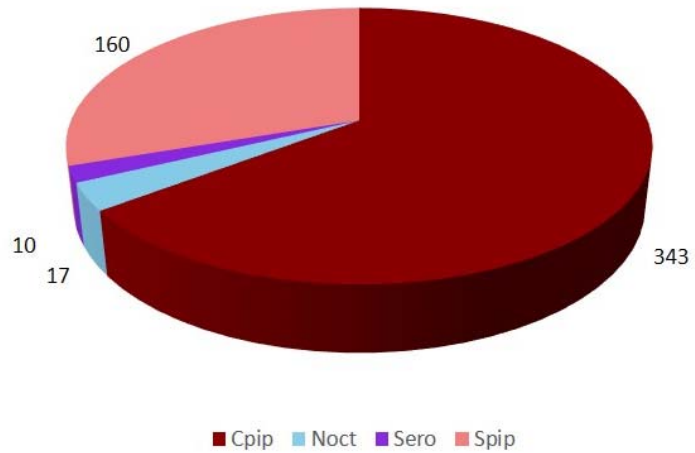
Drawing Title  
Figure 4a - Static Detector Results (May 2019)

Date : 12-08-19 Checked : JJ

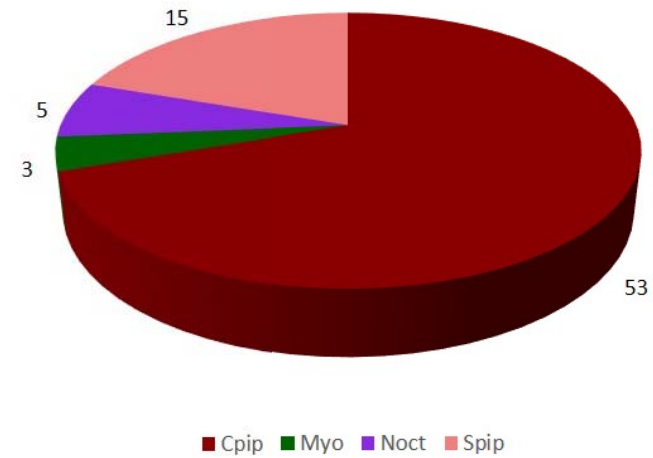
Drawn : GA Approved : N/A

Status : Final Scale : NTS

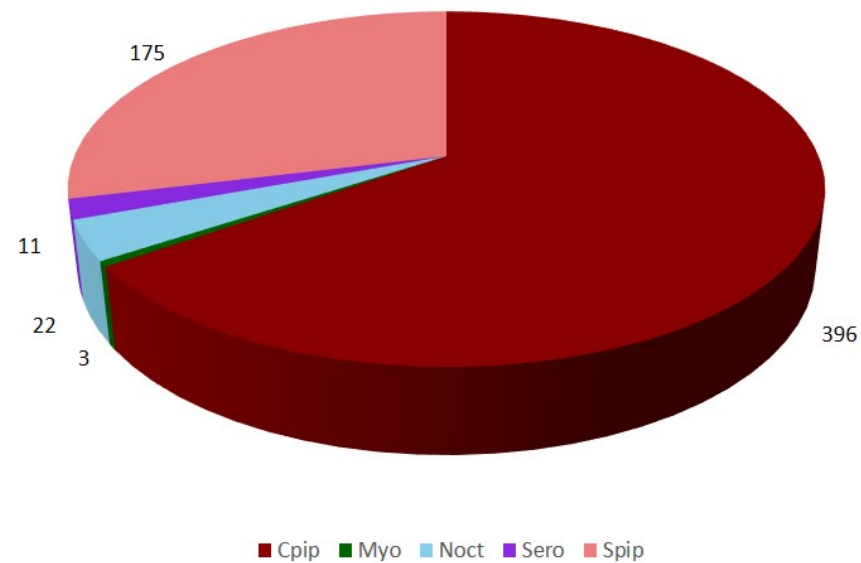
June 2019\_Anabat 1\_North



June 2019\_Anabat 2\_South



June 2019\_Combined Anabat Results



Job Reference : J20563\_P4

Project Title: Reading SGN

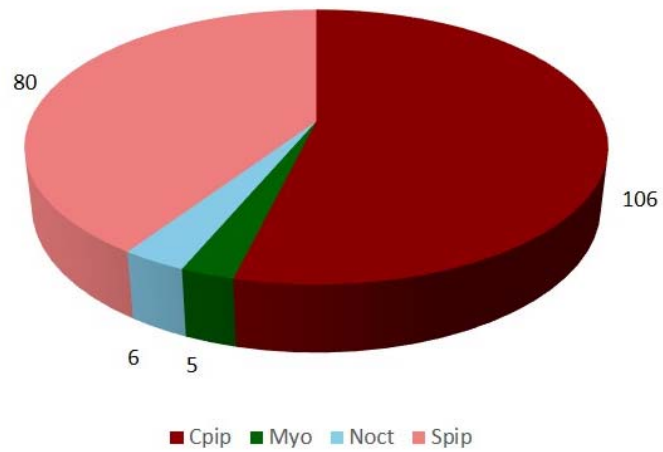
Drawing Title  
Figure 4b - Static Detector Results (June 2019)

Date : 12-08-19 Checked : JJ

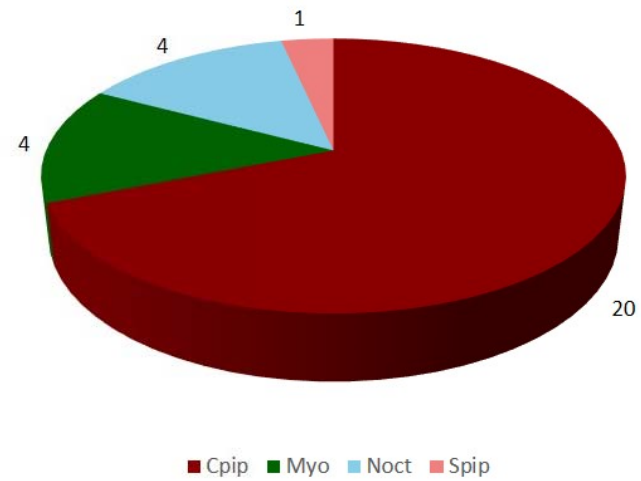
Drawn : GA Approved : N/A

Status : Final Scale : NTS

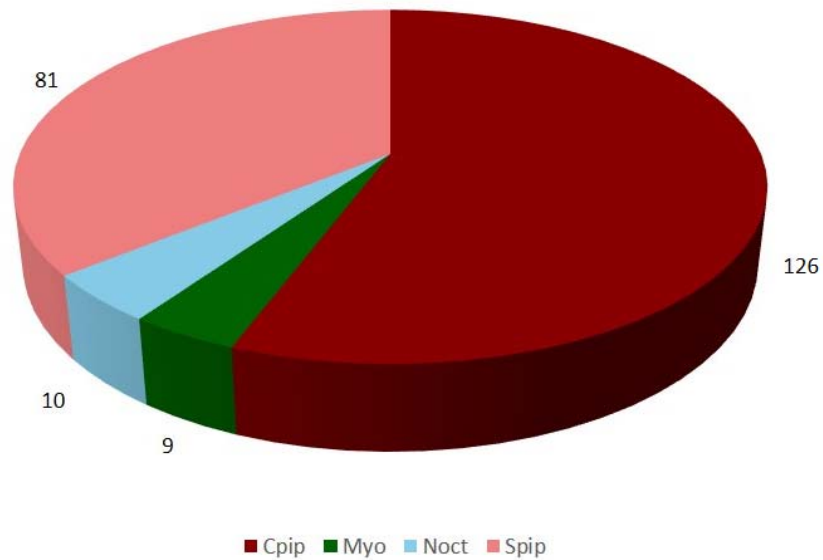
July 2019\_Anabat 1\_North



July 2019\_Anabat 2\_South



July 2019\_Combined Anabat Results



Job Reference : J20563\_P4

Project Title: Reading SGN

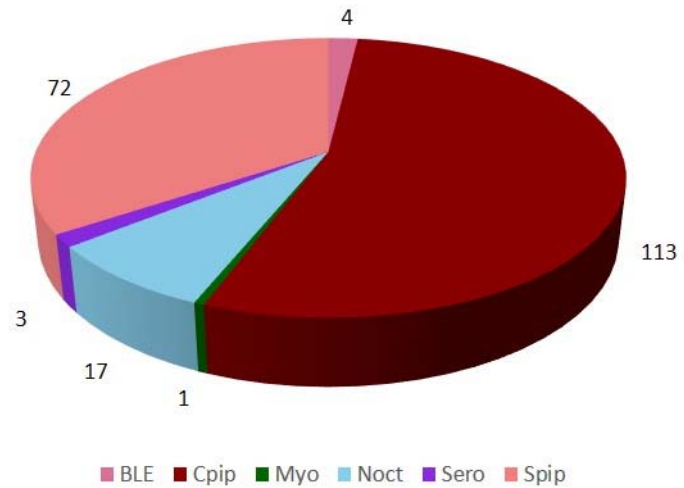
Drawing Title  
Figure 4c - Static Detector Results (July 2019)

Date : 12-08-19 Checked : JJ

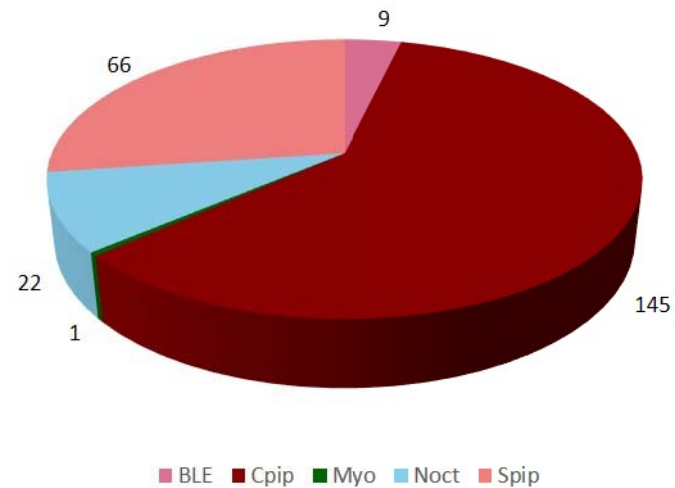
Drawn : GA Approved : N/A

Status : Final Scale : NTS

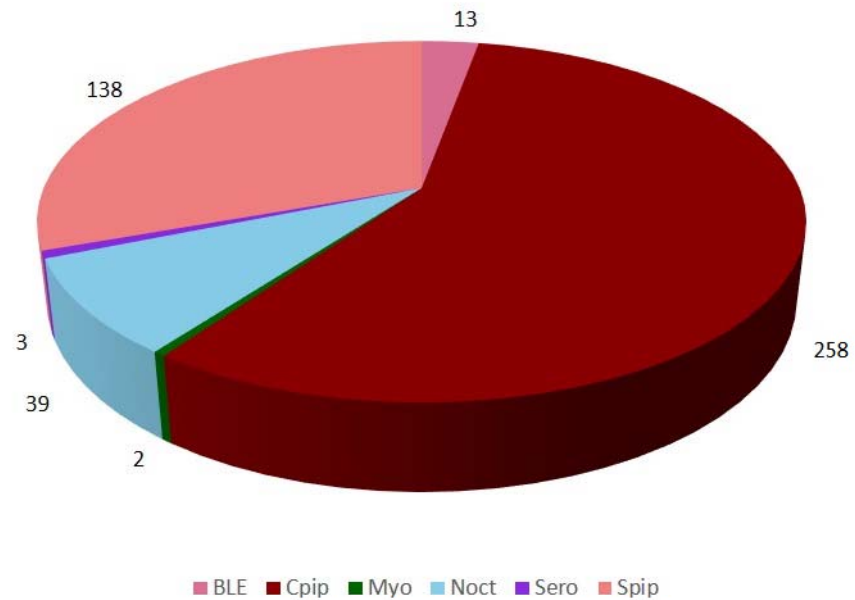
August 2019\_Anabat 1\_North



August 2019\_Anabat 2\_South



August 2019\_Combined Anabat Results



Job Reference : J20563\_P4

Project Title: Reading SGN

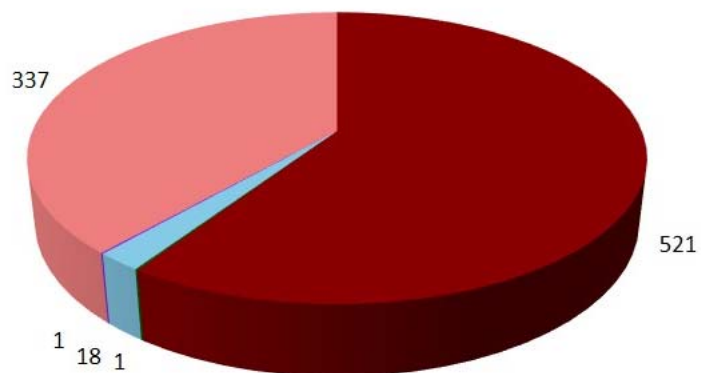
Drawing Title  
Figure 4d - Static Detector Results (August 2019)

Date : 12-08-19 Checked : JJ

Drawn : GA Approved : N/A

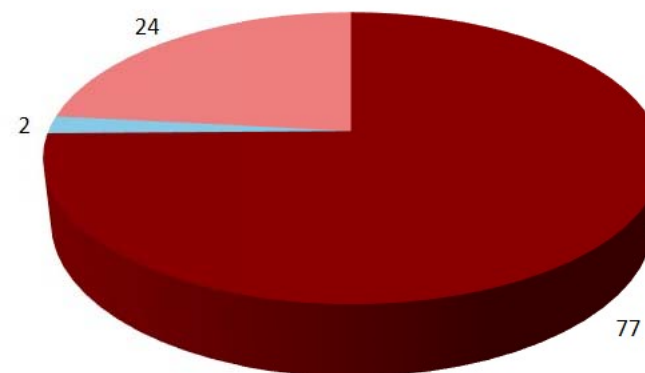
Status : Final Scale : NTS

September 2019\_Anabat 1\_North



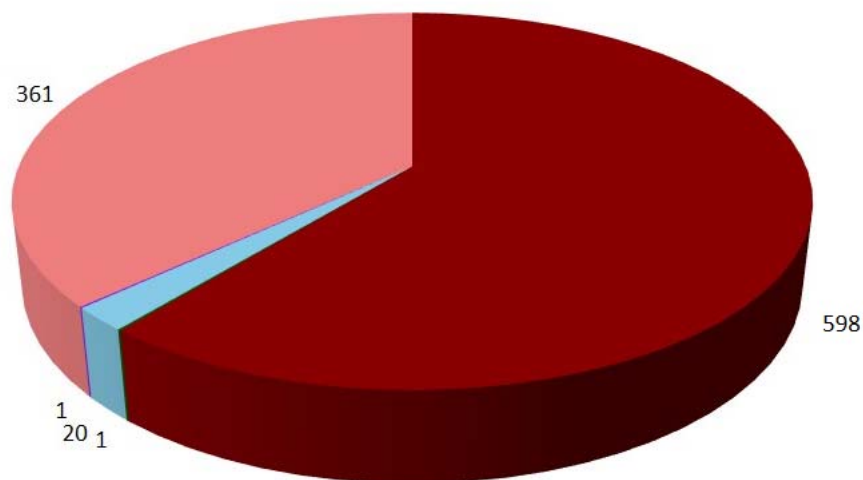
■ Cpip ■ Myo ■ Noct ■ Sero ■ Spip

September 2019\_Anabat 2\_South



■ Cpip ■ Noct ■ Spip

September 2019\_Combined Anabat Results



■ Cpip ■ Myo ■ Noct ■ Sero ■ Spip

Job Reference : J20563\_P4

Project Title: Reading SGN

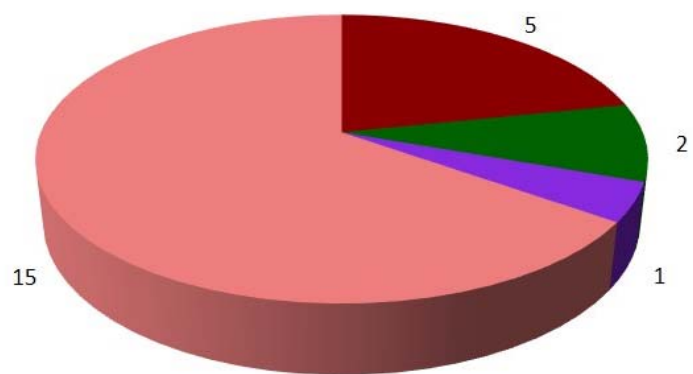
Drawing Title  
Figure 4e - Static Detector Results (Sept 2019)

Date : 17-10-19 Checked : JJ

Drawn : GA Approved : N/A

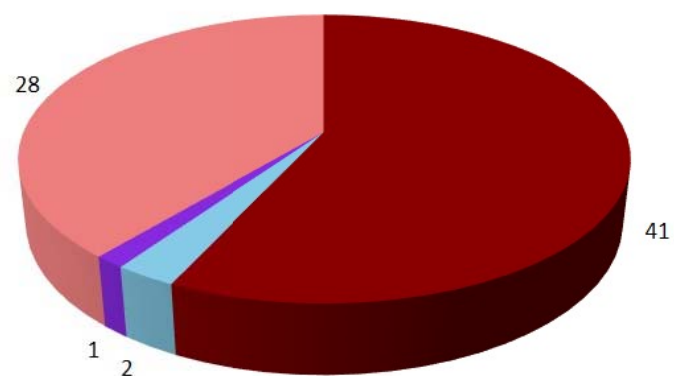
Status : Final Scale : NTS

October 2019\_Anabat 1\_North



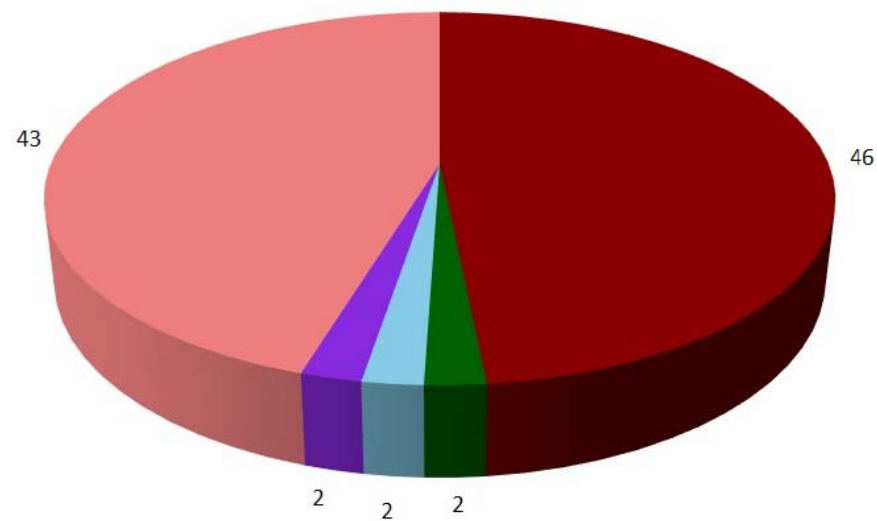
■ Cpip ■ Myo ■ Sero ■ Spip

October 2019\_Anabat 2\_South



■ Cpip ■ Noct ■ Sero ■ Spip

October 2019\_Combined Anabat Results



■ Cpip ■ Myo ■ Noct ■ Sero ■ Spip

Job Reference : J20563\_P4

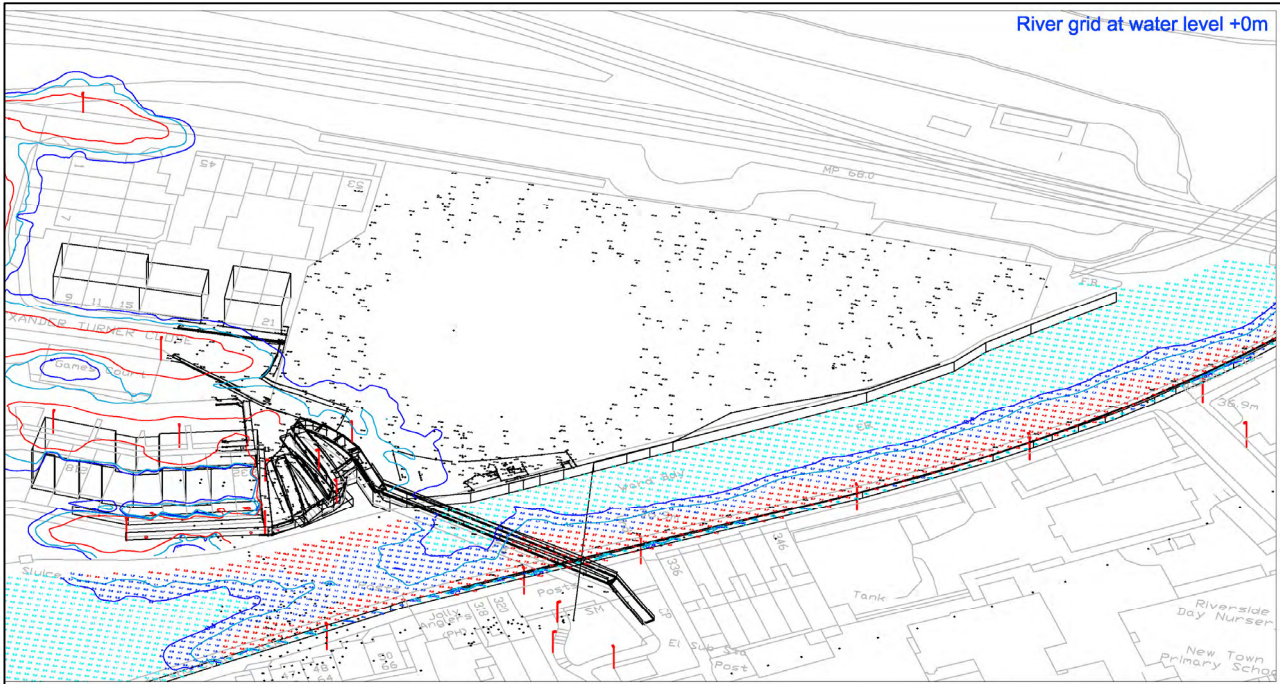
Project Title: Reading SGN

Drawing Title  
Figure 4f - Static Detector Results (Oct 2019)

Date : 17-10-19 Checked : JJ

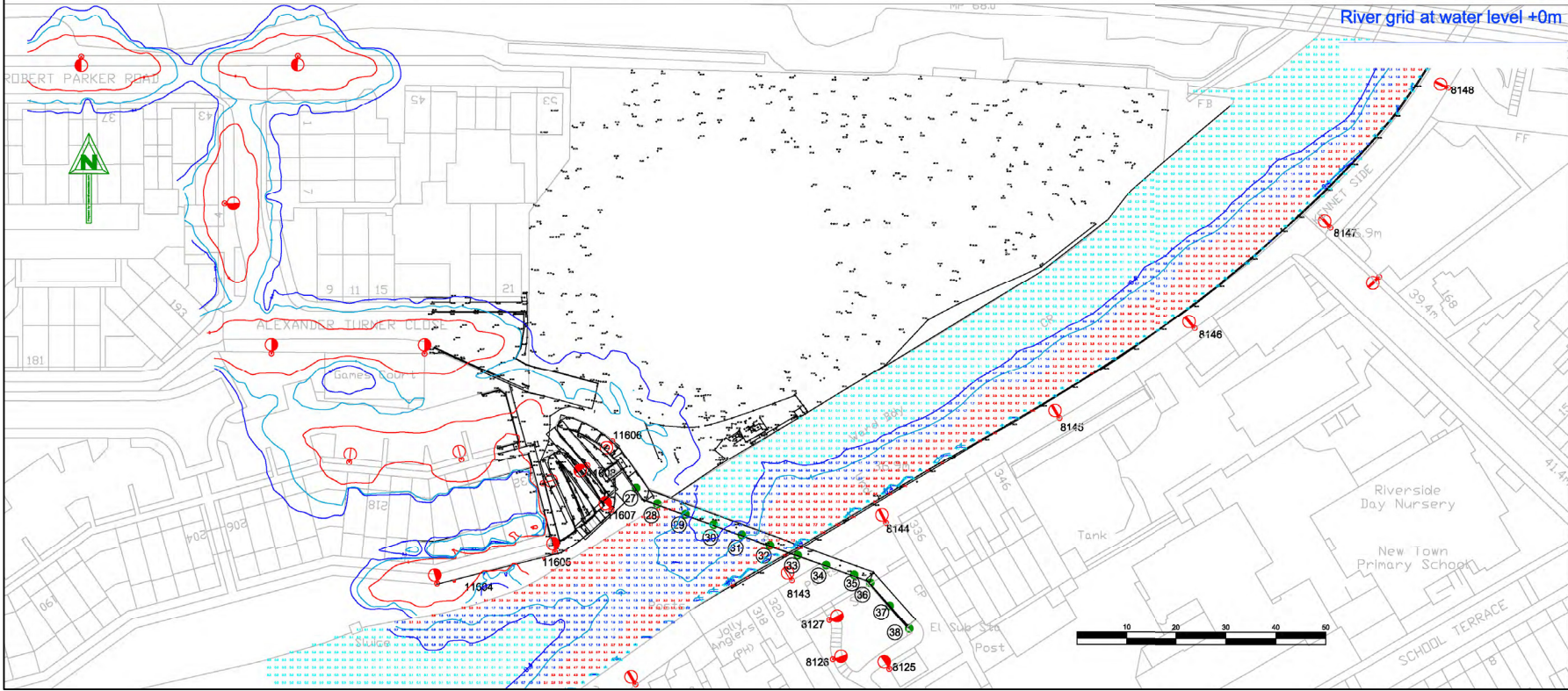
Drawn : GA Approved : N/A

Status : Final Scale : NTS



River grid at water level +0m

This drawing includes the light from the existing street lighting around the development.  
It does not take account of lumen depreciation of any light sources.



River grid at water level +0m

### Notes

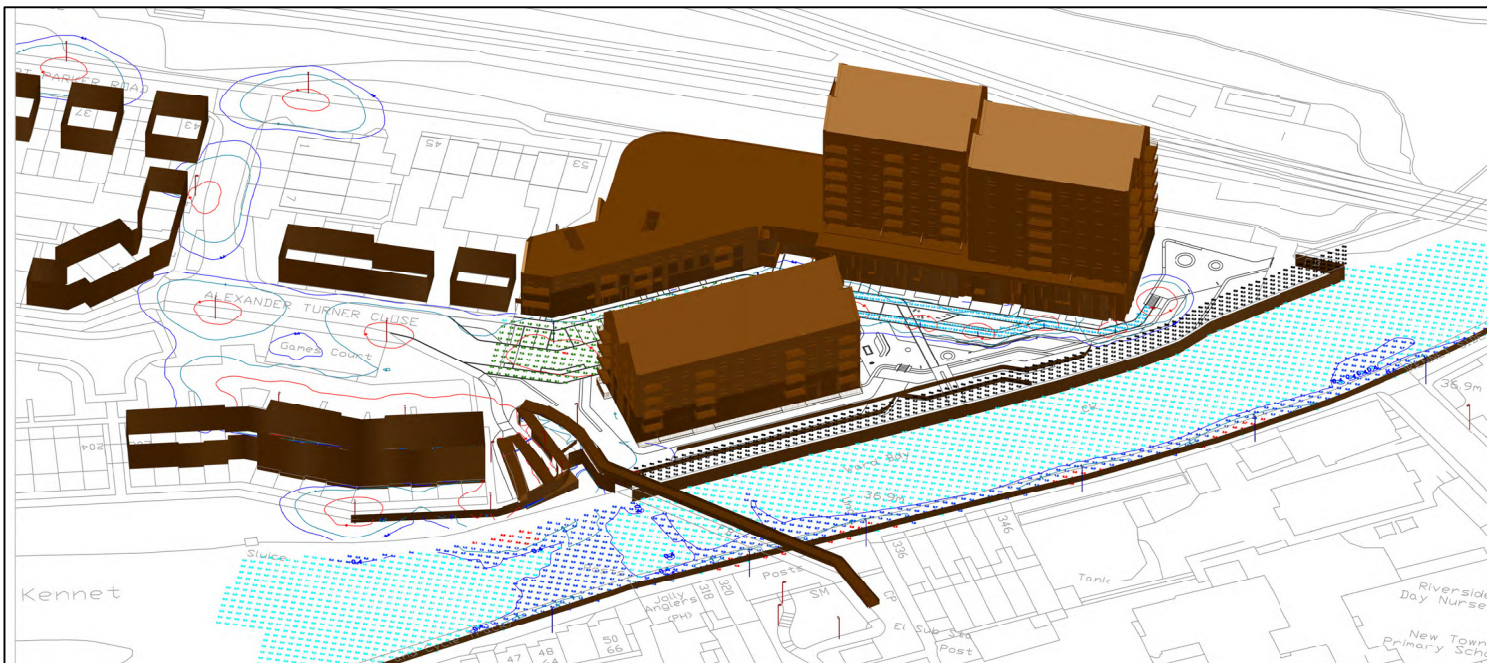
1. In this instance the use of 3 dimensional masking has been used to take into consideration the actual position of high sided objects such as buildings and the like. Trees and shrubs etc have not been considered as their masking ability will vary with seasonal conditions.
2. Iso contours produced in this drawing have been created using a conventional symmetrical grid. This does not take into account the spreading or weightings as detailed in BS5489 or BS EN 13201-3:2003.
3. The water level in the river has been modelled at 35.31m above OS zero level. This data was gathered from the topographical survey.
4. The ground level for the north side of the site has been modelled 38.45m above OS zero level.
5. The ramps and footbridge have been models using data from the 3D survey, the height of the ramp and footbridge varies

### Key

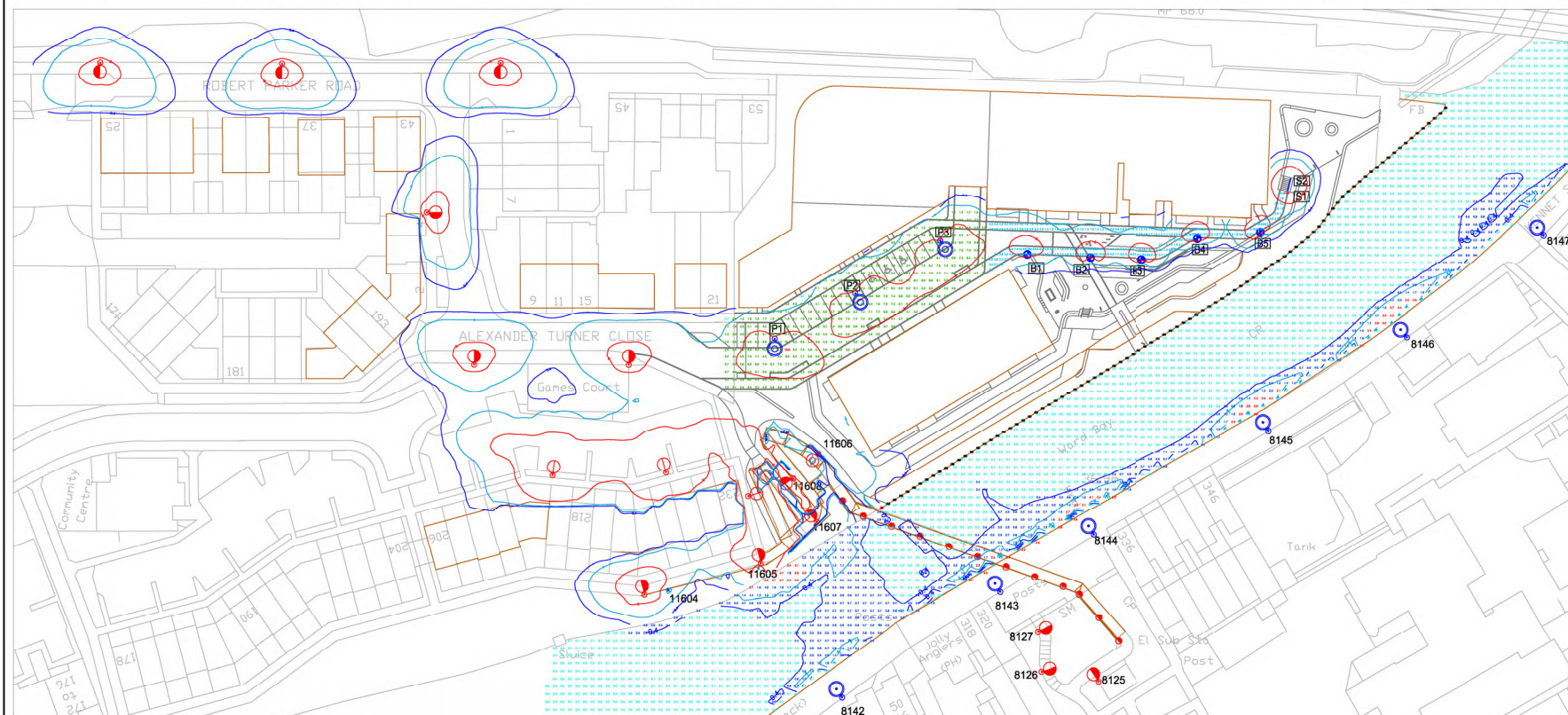
- Existing 6m column with post mounted Urbis Axia with 24 cool white LED
- Existing 6m column with post mounted WRTL Stela wide with 18 no cool white LED
- Existing 5m column with post mounted Holophane VMX lantern with 16 no warm white LED
- Existing 5m column with post mounted Philips ME lantern and 70w SONT lamp
- Existing 5m column with post mounted Urbis Axia with 24 cool white LED
- Existing wall mounted wall packet lantern 70w SONT assumed
- Proposed column number
- Existing column number
- 5.0 lux iso-contour line
- 1.0 lux iso-contour line
- 0.40 lux iso-contour line

Job Reference : J20563\_P4  
Project Title  
Reading SGN Site  
Drawing Title  
Figure 5 - Existing Lux level Impact Plan  
Date : 23-10-19 Checked : JJ  
Drawn : GN Approved : N/A  
Status : Final Scale : NTS





|                                        |       |
|----------------------------------------|-------|
| River Bank Vertical grid @39m          |       |
| 93 points                              |       |
| LUX perpendicular to surface           |       |
| Average                                | 0.0   |
| Maximum                                | 1.0   |
| Minimum                                | 0.0   |
| Min/Avg(Uo)                            | 0.000 |
| Min/Max                                | 0.000 |
| Coef Var                               | 3.417 |
| River Bank Vertical grid @40m          |       |
| 93 points                              |       |
| LUX perpendicular to surface           |       |
| Average                                | 0.0   |
| Maximum                                | 1.0   |
| Minimum                                | 0.0   |
| Min/Avg(Uo)                            | 0.000 |
| Min/Max                                | 0.000 |
| Coef Var                               | 3.753 |
| River Bank Vertical grid @41m          |       |
| 93 points                              |       |
| LUX perpendicular to surface           |       |
| Average                                | 0.0   |
| Maximum                                | 0.9   |
| Minimum                                | 0.0   |
| Min/Avg(Uo)                            | 0.000 |
| Min/Max                                | 0.000 |
| Coef Var                               | 3.868 |
| River Bank Vertical grid @42m          |       |
| 93 points                              |       |
| LUX perpendicular to surface           |       |
| Average                                | 0.0   |
| Maximum                                | 0.7   |
| Minimum                                | 0.0   |
| Min/Avg(Uo)                            | 0.000 |
| Min/Max                                | 0.000 |
| Coef Var                               | 4.560 |
| River Bank Vertical grid @43m          |       |
| 93 points                              |       |
| LUX perpendicular to surface           |       |
| Average                                | 0.3   |
| Maximum                                | 0.3   |
| Minimum                                | 0.000 |
| Min/Avg(Uo)                            | 0.000 |
| Min/Max                                | 0.000 |
| Coef Var                               | 3.726 |
| Footpaths                              |       |
| 107 points at p=36.45, sp 1m by 1m     |       |
| HORIZONTAL LUX                         |       |
| Average                                | 4.7   |
| Maximum                                | 79.4  |
| Minimum                                | 0.7   |
| Min/Avg(Uo)                            | 0.147 |
| Min/Max                                | 0.010 |
| Coef Var                               | 1.367 |
| UnifGrad                               | 6.97  |
| Car Park                               |       |
| 380 points at p=36.45, sp 1.5m by 1.5m |       |
| HORIZONTAL LUX                         |       |
| Average                                | 4.7   |
| Maximum                                | 10.8  |
| Minimum                                | 0.7   |
| Min/Avg(Uo)                            | 0.148 |
| Min/Max                                | 0.065 |
| Coef Var                               | 0.517 |
| UnifGrad                               | 2.13  |



## Notes

- In this instance the use of 3 dimensional masking has been used to take into consideration the actual position of high sided objects such as buildings and the like. Trees and shrubs etc have not been considered as their masking ability will vary with seasonal conditions.
- Iso contours produced in this drawing have been created using a conventional symmetrical grid. This does not take into account the spacing or weightings as detailed in BS5489 or BS EN 13201-3:2003.
- The water level in the river has been modelled at 35.31m above OS zero level. This data was gathered from the topographical survey.
- The ground level for the north side of the site has been modelled 38.45m above OS zero level.
- The ramps and footbridge have been models using data from the 3D survey, the height of the ramp and footbridge varies.

## Key

- Existing 6m column with post mounted Urbis Axia with 24 cool white LED
- Existing 6m column with post mounted WRTL Stela wide with 18 no cool white LED
- Existing 5m column with post mounted Holophone VMX lantern with 16 no warm white LED
- Existing 5m column with post mounted Philips ME lantern and 70w SONT lamp
- Existing 5m column with post mounted Urbis Axia with 24 cool white LED
- Existing wall mounted wall packet lantern 70w SONT assumed
- DW Windsor Garda Hand rail.
- 2 no 1.2m section on free standing posts with 2700K LED to deliver 1400 lumens
- TRT Lighting VIA steel bollard with ASY distribution CLO 2700K LED
- Proposed 5m steel column with TRT aspect Eco with 12 no 2700K LED- GA1 lens- internal driver to deliver L90 CLO at 2290 lumens and photocell set to switch on at 35 lux
- Existing 6m column fitted with Philips Luma Micro (BGP615\_DN10\_1000\_6LED\_5.1S\_CLO\_L90\_WW) at zero degree tit

11 Project column number

11606 Existing column number

- 5.0 lux iso-contour line
- 1.0 lux iso-contour line
- 0.40 lux iso-contour line

Job Reference : J20563\_P4

Project Title  
Reading SGN Site

Drawing Title  
Figure 6 - Proposed Lux Levels Impacts Plan  
(Street Lamp Alteration Strategy)

Date : 23-10-19

Checked : JJ

Drawn : GN

Approved : N/A

Status : Final

Scale : NTS