

Skyline Ecology

Monckton Coke Works

Phase 1 Habitat Survey and UK Habitat Classification

FINAL

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Appendices

Appendix A	Desk Study Information
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1 Executive Summary

- 1.1.1 The site is a former coke works, located on Lund Hill Lane (B6428), to the east of Royston at ordnance survey grid reference SE 374121. The site comprises of a large area of predominantly bare ground where coke processing and storage would have taken place. Many of the buildings which would have once been on site have been demolished leaving numerous piles of building rubble. Around the perimeter of the site are areas of developing woodland and scrub. A number of buildings remain on site which are associated with storage or former office/work usage. Other habitats noted within the site include water bodies and settling tanks, marshy grassland, tall ruderals mosaic habitat on previously developed land and semi-improved grassland.
- 1.1.2 There are limited roosting opportunities for bats within the site. Only Building 1 has any bat roosting potential. The site offers good foraging and commuting opportunities for bats, especially around the northern, southern and western boundaries. Links with other habitat such as the former Barnsley canal to the west and the railway line may allow bats to utilise specific areas of the site for feeding such as the open water habitat, woodland, and marshy grassland.
- 1.1.3 Previous surveys carried out on the site by AES Ltd. recorded a single grass snake in the north eastern corner of the site. The site provides ideal habitat for reptiles around the boundary of the site. Much of the southern part of the existing coke works has numerous rubble piles as a result of buildings being demolished, this provides excellent refugia and basking opportunities. Ponds which are located to the north of the coke works also have rubble piles adjacent, these features also link directly to the rail corridor, broad-leaved woodland, and Barnsley Canal (where records of grass snake have been previously recorded).
- 1.1.4 Previous surveys undertaken by AES Ltd. identified that in 2013 the open water/marshy grassland in the north eastern corner contained a small population of great crested newts. It should be noted that since this survey the dynamics of the site have changed dramatically. This pond identified in 2013 is now more akin to marshy grassland due to the encroachment of willow saplings within the pond. The results of the HSI show that two ponds have excellent suitability to support great crested newts, two have good potential to support great crested newts and one has below average potential to support great crested newts. Terrestrial habitats around all the ponds on site are ideal.
- 1.1.5 SBRC provided 7689 records of birds for the search area consisting of 129 different species. The majority of these records are for Carlton Marsh Nature reserve located 1.5km to the south of the study site and Rabbit Ings Country Park whose boundary is located 50 metres to the east of the site.
- 1.1.6 Evidence of birds was recorded within building 4. Barn owl pellets were recorded close to the eastern entrance and a barn owl flew out of the building during the survey.
- 1.1.7 The scrub habitat and surrounding woodland provide good nesting and feeding opportunities for birds. The dense scrub made observations of nests difficult and the weather resulted in birds not being very active. Other birds recorded during the survey included magpie and blackbird.
- 1.1.8 No invasive species were recorded within the site boundary, however a stand a Japanese knotweed was recorded on the western side of the semi-improved grassland to the south west of the site.
- 1.1.9 It should be noted that within the site there are a number of habitats which fall within the UK and Local BAP, these include ponds and mosaic habitat on previously developed land. As such, replacement ponds and mosaic habitat on previously developed land will need to be provided within the footprint of the development.

- 1.1.10 Building 1 has been identified as having low potential to support small numbers of bats, as such further survey work has been undertaken. To understand how bats are using the study site, bat activity surveys have been undertaken. A full bat survey report has now been completed and should be read in conjunction with this report.
- 1.1.11 Great crested newts have been recorded close to and on the site during previous surveys however, these works were carried out over 4 years ago. A great crested newt survey report has now been completed and should be read in conjunction with this report.
- 1.1.12 It is likely that a reptile trapping scheme to coincide with the great crested newt trapping would need to be carried out in specific parts of the site. Trapping will involve the erection of amphibian and reptile fencing with basking tins or mats within these areas to capture and translocate any animals. Although there is scope for the translocation of reptiles within the study site, it may be more beneficial to translocate reptiles to Rabbit Ings Country Park or to Ellis Laithe LWS to the north until the new on-site habitats become suitably established. Additional habitat creation in the form of log piles could be installed should the respective land managers be accepting of this arrangement.

2 Introduction

2.1 Site Description

- 2.1.1 The site is a former coke works, located on Lund Hill Lane (B6428), to the east of Royston at ordnance survey grid reference SE 374121 (Figure 1 Located in Section 8).

2.2 Description of Project and Background to Commission

- 2.2.1 This ecological report has been prepared by Skyline Ecology on behalf of the client. It is understood that the report is to form a planning application for the development of the site for residential housing.

2.3 Aims of Study

- 2.3.1 The objectives of the desk study and survey were as follows:
- Present evidence of, or any potential for, protected species supported by the site;
 - Set out the legislative and/or policy protection afforded to protected species associated with the site;
 - Present an assessment of any potential ecological impacts of development within the site based on the survey findings;
 - Provide recommendations for any further surveys if considered necessary; and
 - Provide recommendations on mitigation, compensation and/or enhancement measures that are likely to be required to ensure that the proposed development will be acceptable in planning terms and will comply with current wildlife legislation.
- 2.3.2 This report sets out the results of the survey and, in the context of any known ecological interest identified as a result of the desk study, sets out the approach necessary to ensure that effects on any identified ecologically sensitive receptors are avoided or ameliorated. This will ensure that the proposed development will be acceptable with reference to the planning and legal framework relating to ecological resources.

3 Methods

3.1 Desk Study

- 3.1.1 Existing ecological information for the site and its surrounding area was requested from the Sheffield Biological Records Centre (SBRC), West Yorkshire Ecology, South Yorkshire Bat Group (SYBG), South Yorkshire Badger Group and West Yorkshire Bat Group (WYBG). Information relating to statutory and non-statutory designated sites, protected species and species of conservation importance was requested for the site and land up to 2 km from the site boundary. In this case, species of conservation importance were defined as species listed in accordance with Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006). In addition, on-line resources including the Multi Agency Geographic Information for the Countryside (MAGIC) website (<http://magic.defra.gov.uk/>) and aerial photography of the area were also reviewed.

3.2 Phase 1 Habitat Survey

- 3.2.1 An extended Phase 1 Ecological Survey was undertaken on 5th November 2019. The weather during the surveys was cold with occasional heavy rain showers, and an approximate temperature of 7°C. Paul Howden-Leach MCIEEM walked the site and the habitats were described using the Phase 1 Habitat Survey methodology. Target notes were also prepared on features of particular ecological interest and an assessment was made of the site's potential to support protected and notable species.
- 3.2.2 Updates to this survey were carried out during subsequent visits prior to undertaking additional protected species surveys. Additional botanical data was collected on the 7th July 2020, (the weather during this survey was warm and dry with a temperature of 19°C) and the 27th May 2021, (the weather during this survey was dry and bright with a temperature of 20°C). Notes for and additional species encountered were noted and added to the relevant sections of the report.

3.3 UK Habitat Classification

- 3.3.1 As per the recommendations from the local authority a UK Habitat Classification (UKHab) survey was undertaken on the 27th May 2021. The weather during the survey was dry and bright with a temperature of 20°C. Paul Howden-Leach MCIEEM walked the site and habitats were described using the UK Habitat Classification Key (2018) and the UK Habitat classification – Habitat Definitions – V1.0 (2018).

3.4 Bats

- 3.4.1 An assessment of the site's potential to support roosting bats was carried out by licenced bat ecologist Paul Howden-Leach MCIEEM. Buildings were inspected internally (where safe to do so) and externally for evidence indicating the presence of roosting bats or for features with the potential to provide bat roost habitats. Evidence indicating the presence of bats would normally include droppings, characteristic staining, scratch-marks or the presence of live or dead bats.

3.5 Amphibians

- 3.5.1 All ponds within the study site, were assessed for the presence of great crested newts. As part of the survey a Habitat Suitability Index (HSI) assessment was undertaken, which is a measure of the ponds suitability to support great crested newts (Oldham *et al*, 2000). HSI assessments consider the following:

- Geographic location
- Pond area

- Pond drying
- Water quality
- Shade
- Presence of water-fowl
- Presence of fish
- Number of local ponds
- Terrestrial habitat
- Macrophyte coverage

3.5.2 The assessment was carried out by licenced great crested newt ecologist Paul Howden-Leach MCIEEM on the 5th November 2019.

3.6 Limitations to Methods

3.6.1 The initial Phase 1 habitat survey was undertaken at a suboptimal time of year however, further visits were made in the spring and summer of 2020 and May 2021, it is considered that this constraint is therefore removed.

4 Results and Interpretation

- 4.1.1 This section sets out the findings of the desk study and survey work. Whilst every effort was made to provide a comprehensive description of the site during the field survey, no investigation can provide a complete assessment as the natural environment is difficult to predict and can therefore be subject to potential change.
- 4.1.2 The results of the surveys should be read in conjunction with the figures and data located in Section 8 and Appendix A of this report.

4.2 Designated Sites

- 4.2.1 This section should be read in conjunction with the data search records located in Appendix A of this report.

International & National Designated Sites

- 4.2.2 There are no international or national designated sites within the search area

Locally designated sites

- 4.2.3 Barnsley Canal, Local Wildlife Site (LWS) and site of Scientific Interest (SSI), is located approximately 65m to the west of the study site. The site has a mix of wetland habitats including open water and swamp, broad-leaved woodland, hedgerows and scrub. Species including grass snake *Natrix natrix*, reed bunting *Emberiza schoeniclus* and willow tit *Poecile montanus* have been recorded breeding on site.
- 4.2.4 Ellis Laithe LWS is located along the northern boundary of the coke works and on the eastern side of the woodland to the north. The site is a former open cast quarry subject to a restoration scheme. The site has been designated for its areas of open grassland and areas of mature oak and wet woodland. In addition, adders tongue fern *Ophioglossum vulgatum* has been recorded within the site.
- 4.2.5 Carlton Marsh Local Nature reserve and LWS (LNR) is located 1.5km to the south west of the site and is designated for its wetland and bird assemblage. Water voles *Arvicola terrestris* are present within the reserve and extend to the neighbouring Rabbit Ings Country Park (LWS) which is located 50 metres to the east of the study site. Birds such as bittern *Botaurus stellaris*, grey partridge *Perdix perdix*, yellowhammer *Emberiza citrinella*, reed bunting, grasshopper warbler *Locustella naevia*, willow tit, dunnoek *Prunella modularis*, bullfinch *Pyrrhula pyrrhula* and song thrush *Turdus philomelos* have been recorded on the reserve. Other species such as grass snake and great crested newts have also been recorded on the site.

4.3 Habitat Description

- 4.3.1 The study site comprises of a large area of predominantly bare ground where coke processing and storage would have taken place (Image 1). Many of the buildings which would have once been on site have been demolished leaving numerous piles of building rubble (Image 2). Around the perimeter of the site are areas of developing woodland and scrub. A number of buildings remain on site which are associated with storage or former office/work usage. A number of water bodies and settling tanks were also noted.
- 4.3.2 Around the study site Rabbit Ings Country Park lies to the east, young woodland to the north and south, and a railway and former canal to the west.

4.4 Phase 1 Habitat Survey/ UK Habitat Classification

- 4.4.1 This section should be read in conjunction with Figure 2 (Phase 1 habitat survey map 2020) and Figure 3 (UK Habitat Classification map 2021) located in Section 8.1 of this report. Headings in green refer to the Phase 1 habitat survey code whilst subheadings in blue refer to more detailed habitat codes as set out in the UK Habitat Classification.

Bare Ground

- 4.4.2 The majority of the study site is made up of bare ground (Image 1), with emergent vegetation emerging through some areas. The north of the site is the location of the former coke works and by its nature, is believed to be highly contaminated land resulting in very little vegetation around this part of the site, whereas the south of the site is made up of the footings or former buildings, now demolished.

Image 1: View of bare ground of former coke works



Image 2: Sealed concrete surface with thin layer of loose material on top



Developed land – sealed surface (u1b)

- 4.4.3 The majority of the bare ground habitat to the north is classed as a sealed surface of concrete, with what appears to be a thin layer of loose material associated with the coke industry (Image 2). The only vegetation which was recorded growing in this surface were very small silver birch *Betula pendula* saplings and great mullein *Verbascum thapsus* which was occasionally recorded in this part of the site.

Image 3: View of bare ground associated with the former buildings



Image 4: Pond 3, dry



- 4.4.4 The majority of the central and southern parts of the site is made up of the concrete bases of former buildings (Image 3) or are building which have been recently demolished. Scrubby vegetation has begun to appear in these areas, plants such as silver birch saplings, buddleia *Buddleja davidii* and broom *Cytisus scoparius*, have begun to exploit cracks within these former foundations (Image 3).

Artificial unvegetated unsealed surface (u1c)

- 4.4.5 In the north west corner of the coke works the loose material becomes thicker and therefore in effect has the potential to support more vegetation. The diversity in this part of the site is similar to that of the sealed surface, consisting predominantly of small silver birch saplings. This area does contain a hollow (Pond 3) which during the site visit in November 2019 contained water however during all subsequent visits the was dry and therefore is only believed to contain water during periods of sustained heavy rain (Image 4).
- 4.4.6 A number of tall soil bunds have been created since the initial site visit in 2019. These bunds were developed throughout the summer and autumn of 2020 and the majority remain unvegetated during the last sit visit in May 2021.

Open mosaic habitat on previously developed land (u1a)

- 4.4.7 During the initial survey in November 2019 the open mosaic habitat on previously developed land was not believed to be present. Since this date and during significant operational and physical changes within the study site this habitat has begun to develop. The locations of this habitat are associated with the recent creation of two soil bunds, to the north and south of the main coke works. These bunds were completed in the summer of 2020 and were free from vegetation. The site visit in May 2021 has noted that the bunds have become vegetated with early colonising species (Image 5) such as ragwort *Senecio jacobaea*, poppy *Papaver rhoeas*, teasel *Dipsacus fullonum*, red dead nettle *Lamium purpureum*, perennial sow thistle *Sonchus arvensis*, rosebay willowherb *Chamaenerion angustifolium*, weld *Reseda luteola*, coltsfoot *Tussilago farfara*, nettle *Urtica dioica*, common mouse-ear *Cerastium fontanum*, wood avens *Geum urbanum*, mugwort *Artemisia vulgaris*, bird's foot trefoil *Lotus Corniculatus* dandelion *Taraxacum officinale* agg., St John's wort *Hypericum* sp. and spear thistle *Cirsium vulgare*.

Image 5: Vegetation colonising soil bund Image 6: Tall ruderal and scrub to the south.



- 4.4.8 In addition to the above a brick and rubble bund has also become to be colonised by vegetation although this has more scrub dominant plants such as buddleia, the diversity of this bund is dominated by ragwort and weld with silver birch saplings
- 4.4.9 Towards the west of the site, close to the mobile phone mast is a mosaic of tall ruderal and scattered scrub (Image 6). Species recorded in this area include willow, pine, tansy *Tanacetum vulgare*, broad-leaved dock, mugwort *Artemisia vulgaris*, daisy, silverweed

Argentina anserina, bramble, nettle, Yorkshire fog *Holcus lanatus*, hogweed *Heracleum sphondylium*, silver birch, hedge woundwort *Stachys sylvatica* and cocksfoot. There is a distinction between the scrub area and mosaic habitat on previously developed land where tracked machinery has been operating, leaving a thin soil layer which is becoming colonised.

- 4.4.10 Around the lagoons to the north of the site was an area of grassland, located on a thin soil layer. During site visits in 2020 this grassland was set on fire a number of times resulting in the area having little or no vegetation. During the survey in May 2021 this area was categorised as being of mosaic habitat on previously developed land due to the presence of early colonising species such as great mullein, ragwort, rosebay willowherb, cocksfoot *Dactylis glomerata*, Yorkshire fog, bramble, silver birch, nettle and weld.

Woodland

- 4.4.11 The majority of the broadleaved woodland is located around the perimeter of the study site and is generally young birch dominated woodland which has recently succeeded from a scrub habitat.

Other woodland broad-leaved (w1g)

- 4.4.12 To the north west of the site is a long strip of woodland (Image 7) which is dominated by silver birch, other species include dog rose *Rosa canina*, bramble *Rubus fruticosus* agg., broad-leaved willowherb *Epilobium montanum*, rosebay willowherb cocksfoot *Dactylis glomerata*, bluebells *Hyacinthoides non-scripta* (located in one small patch towards the south of the woodland) oak *Quercus robur*, willow *Salix* Sp., hawthorn *Crataegus monogyna*, hazel *Corylus avellana*, field maple *Acer campestre*, dog rose *Rosa canina*, Yorkshire fog *Holcus lanatus* wood avens *Geum urbanum*, tufted hairgrass *Deschampsia cespitosa*, Heather *Calluna vulgaris*, bird's foot trefoil *Lotus corniculatus*, crab apple *Malus* sp., rowan *Sorbus aucuparia*, bramble, honeysuckle *Lonicera periclymenum*, cleavers *Galium aparine*, ribwort plantain *Plantago lanceolata* and young pine *Pinus* sp. This part of the site links directly with the rail corridor and the neighbouring former canal and appears to be the oldest woodland associated with the site. Looking at old air photographs of the site this woodland appeared to begin to develop in the 1990s and became established as an area of continuous woodland in around 2009. It is believed that the soils in this part of the site are thin, as areas of the understory have limited vegetation in places, showing patches of railway ballast. The larger trees are associated with the southern end of the woodland with thinner more newly established birch being more dominant in the north.

Image 7: Woodland to the north west



Image 8: Woodland on northern boundary.



- 4.4.13 The woodland located on the northern boundary of the main coke works is believed to have been part of a planting scheme developed in around 2009 as a shelter belt on top of a bund (Image 8). The planting scheme would have originally been planted with white poplar *Populus*

alba which is native to central and southern Europe but has naturalised within the UK. Other trees such as silver birch and willow species now make up this young woodland belt. There appears to have been little or no management to the site resulting in many of the trees growing close together. The understory is dominated by bramble and has a large number of willow saplings within its makeup.

- 4.4.14 The woodland in the north eastern corner of the site is dominated by willow and silver birch (Image 9), with willow being the more dominant species, resulting in a dense covering of saplings and young trees. This part of the site appears to be wetter with a small open area of marsh grassland located to the north. It is believed that this area has succeeded from a grassland habitat and has only succeeded into a young woodland habitat since around 2015. Evidence of former grassland and wetland species can be found in the grassland sward. Species recorded include pendulous sedge *Carex pendula* and hard rush *Juncus inflexus*. Also, within the eastern section of the woodland there are species within the ground flora which suggest that this part of the site has recently succeeded from grassland habitat with species such as cow parsley *Anthriscus sylvestris* and Yarrow *Achillea millefolium lanceolata*, creeping thistle *Cirsium arvense*, creeping buttercup *Ranunculus repens*, wild carrot *Daucus carota*, daisy *Bellis perennis*, selfheal *Prunella vulgaris*, St John's wort, False oat grass *Arrhenatherum elatius*, canary reed grass *Phalaris arundinacea*, ragwort *Senecio jacobaea* and teasel *Dipsacus fullonum*.

Image 9: Woodland in the north east corner



Image 10: Woodland to the south of the site.



Other woodland broad-leaved (w1g)

- 4.4.15 To the south of the study site located close to the water treatment works is an area of plantation woodland (Image 10). The woodland was planted around 2002 to 2005 and has been done so for wildlife purposes rather than commercial timber. As such there is a wide mix of tree species within the plantation. Species recorded include Alder *Alnus gomerata*, silver birch, pine, European larch *Larix decidua*, willow, blackthorn *Prunus spinosa* and dog rose. Other species recorded include cocksfoot, cleavers, herb Robert *Geranium robertianum* and cotoneaster *Cotoneaster* sp. Due to a lack of formal management much of this part of the site is densely vegetated with trees growing close together and therefore access into all areas of the site could not be fully gained.

Scrub

- 4.4.16 There is a mix of scrub habitat within the site going through different stages of succession, from area of scattered scrub to dense blackthorn dominated scrub. Throughout the areas of rubble are a number of areas of scattered scrub these are predominantly dominated by buddleia and silver birch and are associated with cracks between the sealed surface (Image 3).

Blackthorn scrub (h3a)

- 4.4.17 The main area of scrub is located within a steep valley to the south of the site, to the north west of the water treatment works (Image 11). The scrub bank was too steep and scrub too dense to assess in detail and therefore was assessed from a distance. The bank is mainly dominated by hawthorn and blackthorn scrub.

Dense scrub (h3)

- 4.4.18 Along the western boundary of the site is a line of stacked tyres which appear to have been used as planters (Image 12). The tyres continue for a length of approximately 150 metres and have been vegetated by a scrub/ hedgerow type of feature, which is mainly dominated by silver birch, hawthorn and blackthorn, although unlike a hedgerow does not appear to be formally managed since colonisation.

Image 11: Bank of dense blackthorn scrub



Image 12: Tyre wall and scrub



- 4.4.19 To the southeast corner of the study site is what would have once been a formally planted hedgerow or part of a landscaping scheme. Due to the lack of management this area has become a line of tall scrub/low woodland with dense bramble cover and short scrubby trees such as hawthorn, blackthorn, cherry *Prunus* sp. and rowan.

Grassland

- 4.4.20 Grassland is limited within the study site; this is likely due to lack of management on site and as such most of the grassland is currently succeeding into tall ruderal or scrub habitat.

Other swamps (f2f)

- 4.4.21 The north east corner of the site has small patches of marshy grassland which is succeeding into tall ruderals and scrub. The category for this part of the site falls between grassland and wetland as there are a number of wet tolerant species in this area. The area has recently been cleared of the young willow trees which dominated the area since the survey undertaken in 2019 and is now a boggy area with small patches of open water (Image 13). This area is probably the most botanically diverse part of the site because of the mix of habitats. Species recorded in this area include black knapweed, yarrow, ribwort plantain *Plantago lanceolata*, creeping thistle, creeping buttercup, weld, daisy, selfheal *Prunella vulgaris*, St John's wort, false oat grass *Arrhenatherum elatius*, canary reed grass *Phalaris arundinacea*, ragwort *Senecio jacobaea*, wild carrot and teasel *Dipsacus fullonum*.

Image 13: Recently cleared willow scrub



Image 14: Seeded grassland to the south of the site



Neutral grassland (g3)

- 4.4.22 To the east of the site what would have once been formal amenity grassland have now become rank grasslands. These two small patches of grass are made up of cocksfoot, false oat grass, spear thistle, cat's ear *Hypochaeris* sp., yarrow, great mullein, mugwort, creeping buttercup and ragwort *Senecio jacobaea*.
- 4.4.23 To the south of the study site is an area of grassland more akin to a roadside verge. This grassland is more diverse, being located away from the main coke works and appears to have been seeded in the past (Image 14). Species recorded here include, Yorkshire fog, creeping buttercup, cocksfoot, cowslip *Primula veris*, ribwort plantain, hogweed, cow parsley bramble, red clover and false oat grass. This area of land may be managed in part from regular mowing.

Modified grassland (g4)

- 4.4.24 At the south western corner of the study site (separated by the railway track), is an area of semi-improved grassland (Image 15). It appears that this is part of a former tip and has been capped. On initial inspection in 2019 grassland appears to have been grazed as the sward is extremely short, however no evidence of grazing or other management was noted in 2020 or 2021 suggesting that the grassland is struggling within the current soil conditions. From looking at old air photos of this part of the site the land appears to have been turned into a grassland in 2008, with some formal management in the form of a hay cut during this early seeding of the site. Species recorded in this area include selfheal *prunella vulgaris*, ribwort plantain, white clover, bent grass *Agrostis* sp., Yorkshire fog, spear thistle, ragwort, creeping buttercup and oxeye daisy *Leucanthemum vulgare*.

Open water

- 4.4.25 There are three main open water habitats within the study site. All three of these are located to the north of the coke works.

Standing water (r1)

- 4.4.26 There are two former settling lagoons which are separated by scattered scrub and tall ruderals (Pond 1, Image 16 and Pond 2, Image 17). The lagoons have steep sided concrete walls and are fenced on all sides. Vegetation within the ponds was limited to broad-leaved pondweed *Potamogeton natans* located within Pond 1 only.

Image 15: Semi-improved grassland



Image 16: Pond 1



- 4.4.27 To the west of this is another pond (Pond 3) which is more natural than the above lagoon, the pond did not have any vegetation at the time of survey (Image 17) and only contained water during the initial site visit in November 2019, after a period of heavy rain. For the rest of the survey visits during 2020 and 2021 the pond was dry (Image 4).

Image 17: Pond 2



Image 18: Pond 3



- 4.4.28 An area of wet grassland to the north east which did hold a small amount of water at the time of the initial survey in 2019 survey (Pond 4), dried during 2020, this is thought to be due to the large number of willow saplings within and adjacent to this. During the visit in May 2021 all of the willow trees had been removed leaving a shallow (10cm deep) long pool. It is not known if this pool contains water throughout the year but the removal of willow from the area may give it more permanence.
- 4.4.29 During the survey in 2019 a single concrete trough/hole was recorded as containing water (Image 18). All subsequent visits to the site showed this feature to be dry and therefore it is believed that this feature only fill after periods of intense rainfall.

Image 19: Pond 3



Image 18: Pond 5



Buildings

- 4.4.30 A full detailed building description can be found in section 4.5. Figure 3 located in section 8.2 shows the location of each of the buildings.

4.5 Species

Bats

- 4.5.1 SYBG provided a total of 71 bat records for the search area. A large proportion of these are for records associated with Carlton Marsh and were for Pipistrelle species *Pipistrellus* Sp. and noctule bats *Nyctalus noctule*. The largest roost within the search area is for 57 bats located approximately 200 metres to the east of the study site. Species recorded within the search area include Leisler's bat *Nyctalus leisleri*, common pipistrelle bat *Pipistrellus pipistrellus*, Whiskered/Brant's bat *Myotis mystacinus/brandti*, Daubenton's bat *Myotis daubentonii* and brown long-eared bat *Plecotus auritus*.
- 4.5.2 SBRC provided 140 records of bat within the search area. The majority of these are for Carlton Marsh LNR located approximately 1.5km to the south of the site, Rabbit Ing's Country Park located 150 metres to the east of the site and Cudworth, approximately 240 metres to the east. A number of roosts were recorded within the search area. Only three roosts were recorded by SBRC, the closest of which is for a single unknown bat species 600 metres to the west of the study site.
- 4.5.3 West Yorkshire Bat Group (WYBG) provided eight records for the search area the closest of which is for a common pipistrelle maternity roost located approximately 750 metres south of the study site. Only *Pipistrellus* and *vespertilionidae* species were identified within the data search.
- 4.5.4 Each building on site was assessed for its potential to support roosting bats. A full internal and external assessment was carried out where access allowed. Figure 4 located in Section 8.2 of this report shows the location of each of the buildings described below.

Building 1

- 4.5.5 A brick building with a flat concrete roof. This building has been in constant use until September 2019 as an engineering workshop and stores (Image 19). Since that time doors and windows have been boarded and access restricted. The building is steel framed and well-sealed, with no access points noted within the main building itself. All external masonry is well-pointed with no potential access points for bats. On the southern and western aspects of the building is an area of felt which has lifted slightly along the roof line, this may have some

limited potential for small numbers of summer roosting bats. The assessment of this building under current guidance is of low potential to support roosting bats.

Image 19: Building 1



Image 20: Lifted felt on western side of Building 1



Building 2

- 4.5.6 Building 2 is a detached single-story brick building with a concrete pitched roof (Image 21). All windows and doors have been boarded with either wooden or metal shutters and as such no access could be gained inside the building. All fascias and soffits are well-sealed with no gaps or cavities (Image 22) and there are no access points within the roof or within the masonry. The building has been classed as having negligible potential to support roosting bats.

Image 21: Building 2



Image 22: Sealed fascias in Building 2



Building 3

- 4.5.7 Building 3 is a steel framed brick building which currently has no roof (Image 23). The building has no obvious roosting features and has negligible potential for roosting bats.

Image 23: Building 3



Image 24: Building 4



Building 4

- 4.5.8 Building 4 is a brick and corrugated steel building with a concrete frame (Image 24). There are numerous holes within the roof and walls and the eastern elevation is completely open. No obvious roosting features were recorded within the building and as such the building has negligible potential to support roosting bats.

Image 25: Building 5



Image 26: Collapsed brickwork



Building 5

- 4.5.9 Building 5 is a structure associated with the coke process. The structure is approximately 30 metres tall and 20 by 20 metres in diameter. The majority of the structure is made from concrete with steel supports and some brickwork (Image 25). The structure is difficult to assess due to the height, however using close focusing binoculars there do not appear to be any obvious areas suitable for roosting bats. On the northern elevation at the western side there is an area of brick work which has collapsed resulting in a number of cracks in the masonry (Image 26), however much of this area was very wet during the daytime survey and it is unlikely that bats would be using this structure for roosting. Building 5 has negligible roosting opportunities for bats.

Building 6

- 4.5.10 Building 6 is a flat roofed brick structure which is currently being used as an electricity substation (Image 27). An internal inspection of the building could not be carried out as all windows and doors had either been reinforced or sealed, resulting in no potential access

points. Building 6 has negligible roosting opportunities for bats and has since been demolished.

Image 27: Building 6



Image 28: Building 7



Building 7

- 4.5.11 Building 7 is a large portacabin which has been extensively vandalised (Image 28). The majority of the windows have been smashed and all doors are open. Building 7 has no features which would support roosting bats and therefore the bat roosting potential is considered to be negligible.

Building 8

- 4.5.12 Building 8 is a steel framed former workshop with breezeblock and corrugated steel walls (Image 29). The building has no roof and as such is open and exposed. No bat roosting features were noted and as such the bat roosting potential of this building is negligible.

Image 29: Building 8



Image 30: Rubble piles suitable for reptile and amphibian refugia



- 4.5.13 The site offers good foraging and commuting opportunities for bats, but these are limited to the northern, southern and western boundaries. Links with other habitat such as the former Barnsley canal to the west and the railway line may allow bats to utilise specific areas of the site for feeding such as the open water habitat, woodland and marshy grassland.

Hibernating bats

- 4.5.14 As the potential for roosting in general around the site is either low or negligible. None of the buildings offer potential for hibernating bats, this is either due to water ingress and or unsuitable roosting features.

Reptiles

- 4.5.15 SBRC provided 32 records of reptile for the search area, all of which are for grass snake, the majority of these are for Carlton Marsh LWS located approximately 1.5KM to the south of the study site. The closest records are for Rabbit Ings Country Park located 150 metres to the east and a single record for Barnsley Canal located approximately 900 metres to the south. It should be noted that the former Barnsley canal is located approximately 50 metres from the western boundary of the study site, and it is likely that reptiles would use the length of both the rail and canal corridor.
- 4.5.16 Previous surveys carried out on the site by AES Ltd (Appendix B). recorded a single grass snake in the north eastern corner of the site, where there is an area of marshy grassland present, no other reptile records were noted as part of the survey. It should be noted that the grass snake was recorded was found during an amphibian survey and not as part of the eight visits associated with the official reptile survey. This report has been included as part of Appendix B of this report. The location of this habitat connects directly with Rabbit Ings Country Park, through an existing underpass.
- 4.5.17 The site provides ideal habitat for reptiles. Much of the southern part of the existing coke works has numerous rubble piles as a result of building being demolished (Image 30), this provides excellent refugia and basking opportunities. Ponds which are located to the north of the coke works also have rubble piles adjacent (Image 31), these features also link directly to the rail corridor, broad-leaved woodland and Barnsley Canal (where records of grass snake have been previously recorded).
- 4.5.18 Further to the refugia recorded on site, some of the rubble piles have been mixed with soil and are now becoming vegetated (Image 32). These piles make ideal hibernacula for reptiles. The majority of these are located within the areas of bare ground.

Image 31: Rubble pile adjacent to ponds 1, 2 and 3



Image 32: Potential hibernacula for reptiles and amphibians



Amphibians

- 4.5.19 SBRC provided 100 records of amphibian for the search area, of these 47 are for common toad *Bufo bufo*, and seven are for great crested newts *Triturus cristatus* the closest of which appears to be 50 metres to the east of the site at Rabbit Ings Country Park.
- 4.5.20 Previous surveys undertaken by AES Ltd. Identified that in 2013 the open water/marshy grassland in the north eastern corner contained a small population of great crested newts. It should be noted that since this survey the dynamics of the site have changed dramatically. This pond identified in 2013 is now more akin to marshy grassland due to the encroachment of willow saplings within the pond. In addition, a new pond has been recorded on site which was not present in 2013 (Pond 5) which may have the potential to support great crested newts. According to AES Ltd the repeat survey for great crested newts undertaken in 2015 did not find great crested newts within the study site.
- 4.5.21 As well as the above survey in 2009 a European Protected Species Licence (EPSL) was granted within Rabbit Ings Country Park to translocate great crested newts. According to AES Ltd 156 great crested newts were moved as part of this licence. Further monitoring visits in 2013 found great crested newts to be present within ponds associated with Rabbit Ings Country Park.
- 4.5.22 As stated in section 4.4 the study site has three main waterbodies which are all located to the north west of the main coke works. In addition, an area of marshy grassland to the north east and a seasonal pond have been recorded on site. A full habitat suitability index (HSI) assessment of these features has been undertaken to ascertain if these water bodies are suitable to support great crested newts (Table 1). A plan of the location of the ponds can be found in section 8.4 (Figure 5) of this report.
- 4.5.23 The results of the HSI show that ponds 1 and 4 have excellent suitability to support great crested newts, ponds 2 and 3 have good potential to support great crested newts and pond 5 has below average potential to support great crested newts.

Table 1: HSI score for five waterbodies recorded on site

Pond ref	Pond 1	Pond 2	Pond 3	Pond 4	Pond 5
SI1 - Location	1	1	1	1	1
SI2 - Pond area	0.8	0.6	0.5	0.2	0.1
SI3 - Pond drying	0.9	0.9	1	1	0.1
SI4 - Water quality	0.33	0.33	0.33	0.67	0.33
SI4 - Shade	1	1	1	1	1
SI6 - Fowl	0.67	0.67	1	1	1
SI7 - Fish	1	1	1	1	1
SI8 - Ponds	1	1	1	1	1
SI9 - Terr'l habitat	1	1	1	1	1
SI10 - Macrophytes	0.5	0.3	0.3	0.8	0.3
HSI	0.78	0.72	0.74	0.80	0.50

- 4.5.24 Terrestrial habitats around all of the ponds on site are ideal. Ponds 1, 2 and 3 all have rubble piles adjacent to them (Image 31) as well as young birch woodland and abandoned tyres which have now become densely vegetated. Pond 4 is surrounded by dense scrubby vegetation and is close to rubble piles within the wider landscape. There is also an underpass bridge here which connects the site directly with Rabbit Ings Country Park. Pond 5 which is the least suitable of all the water bodies is surrounded by rubble, tall ruderals and has direct links to the railway line and neighbouring Barnsley Canal.

- 4.5.25 Ponds outside of the study site have not been formally assessed as part of this report. From previous reports it is believed that an additional seven ponds exist within the surrounding area.

Birds

- 4.5.26 SBRC provided 7689 records of birds for the search area consisting of 129 different species. The majority of these records are for Carlton Marsh Nature reserve located 1.5km to the south of the study site and Rabbit Ings Country Park whose boundary is located 50 metres to the east of the site. Both tawny owl *Strix aluco* and barn owl *Tyto alba* have been recorded within the search area. Moorland species have also been recorded; curlew *Numenius arquata*, grey partridge *Perdix perdix*, Lapwing *Vanellus vanellus* and snipe *Gallinago gallinago*. In addition, there are a number of birds associated with woodland habitat such as tree pipit *Anthus trivialis*, tree creeper *Certhia familiaris* and great spotted woodpecker *Dendrocopos major*. Other species of interest which may colonise a site such as this include Peregrine *Falco peregrinus*, kestrel *Falco tinnunculus*, Merlin *Falco columbarius* and buzzard *Pernis apivorus*.
- 4.5.27 Evidence of birds was recorded within building 4. Barn owl pellets were recorded close to the eastern entrance and a barn owl flew out of the building during the survey (Target Note 2). Pigeons were recorded nesting within Building 4. As many of the buildings are either well-sealed or have no roof, nesting opportunities within these features are limited.
- 4.5.28 Building 5 has the potential for nesting peregrine as the building is not subject to any disturbance and replicates the birds natural nesting preferences. It should be noted that peregrine have been recorded within the data search.
- 4.5.29 The scrub habitat and surrounding woodland provide good nesting and feeding opportunities for birds. The dense scrub made observations of nests difficult and the weather resulted in birds not being very active. Other birds recorded during the survey included magpie and blackbird.

Image 33: Barn owl pellets within Building 4



Image 34: Japanese knotweed



Badgers

- 4.5.30 SBRC provided two records of badger *Meles meles* for the search area, the closest of which is associated with Rabbit Ings Country Park. An exact grid reference has not been provided for these records. South Yorkshire Badger Group have been contacted but no records have been supplied at the time of writing this report.
- 4.5.31 No evidence of badger was recorded during the survey.

Other Protected Species

- 4.5.32 SBRC provided 497 records of water vole *Arvicola terrestris* within the search area. The majority of these are associated with Rabbit Ings Country Park and Carlton Marsh LNR. No streams or running water have been recorded on site and the open water areas such as settling ponds are suboptimal for water voles due to their limited vegetation and burrowing potential.
- 4.5.33 SBRC have provided 16 record for harvest mouse *Micromys minutus* for the search area. All of these records are associated with the reed beds at Rabbit Ings Country Park and Carlton Marsh LNR. Whilst the study site does have a marshy grassland area it is believed that this is too small to support harvest mouse. A number of small stands of canary reed grass were recorded in this area (a favoured plant for nest building) however the plant is not abundant enough to allow for nest building.
- 4.5.34 SBRC have provided 46 records for brown hare *Lepus europaeus* for the search area. The majority of these are for Rabbit Ings Country Park and Carlton Marsh LNR. It is possible that brown hare use the site, especially areas to the north east which connect directly with Rabbit Ings Country Park. The study site is however suboptimal for brown hare and is unlikely to support breeding.

Non-native/invasive Species

- 4.5.35 No invasive species were recorded within the site boundary, however a stand a Japanese knotweed *Fallopia japonica* was recorded on the western side of the semi-improved grassland to the south west of the site (Target Note 9). The plant is growing at the back of a series of garages (Image 34) and is within 5 metres of the site boundary.

5 Legislation and Impacts

5.1 Planning Policy Context

- 5.1.1 The National Planning Policy Framework (NPPF) came into effect in March 2012. It states that the planning system should seek to contribute to and enhance the natural and local environment by minimising impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity.
- 5.1.2 The Government launched new Planning Practice Guidance to support the NPPF in March 2014. The new Guidance on the Natural Environment (ID:8) states that information on biodiversity impacts and opportunities should inform all stages of development; it refers to guidance given in the Government Circular 06/2005 (ODPM, 2005) with regards to advice on protected species. Paragraph 99 of the Circular states "It is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision."
- 5.1.3 The new Planning Practice Guidance reiterates section 40 of the NERC Act 2006, which places a duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity. Paragraph 117 of the NPPF also states that local authorities should seek to promote the preservation, restoration and re-creation of priority habitats and recovery of priority species populations, linked to national and local targets, through planning policies. Priority habitats and species referred to in the NPPF relate to species and habitats of principle importance listed in accordance with section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

5.2 Habitats

- 5.2.1 UK Biodiversity Action Plan (BAP) priority habitats and species are those that have been identified as being the most threatened and hence require conservation action under the UK BAP. The 'UK Post-2010 Biodiversity Framework' superseded the UK BAP in July 2012, however the lists of priority habitats and species are still in place.
- 5.2.2 Barnsley Biodiversity Trust has developed Local Biodiversity Action Plans (LBAPs) which identify habitats and species of principal importance which are present in their region and which need to have specific conservation objectives and actions prepared, in line with the UK Post-2010 Biodiversity Framework (JNCC and DEFRA, 2012²⁵). These LBAPs for habitats and species are referred to where relevant in this assessment to assist with determining the level of importance/ evaluation of ecological features.
- 5.2.3 Two UK BAP and LBAP Priority habitats are relevant to this site, ponds and mosaic habitat on previously developed land.
- 5.2.4 It is likely that some of the priority habitats mentioned above will be lost as a result of the proposed development and therefore these would need to be replaced or compensated for to comply with current planning policy.

5.3 Bats

- 5.3.1 Bats and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended), and by the Conservation of Habitats and Species Regulations 2012. Taken together, these make it an offence to:
 - a) Deliberately capture, injure or kill a bat;
 - b) 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.
 - c) To be in possession or control of any live or dead bat or any part of, or anything derived from a bat;
 - d) Damage or destroy a breeding site or resting place of a bat;
 - e) Intentionally or recklessly obstruct access to any place that bat uses for shelter or protection;
 - f) Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection.
- 5.3.2 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 re-use the same roost sites, current legal opinion is that a bat roost is protected whether or not the bats are present at the time.
- 5.3.3 Seven bat species are listed in the UK Biodiversity Action Plan and are listed as Species of Principal Importance under the provisions of the NERC Act 2006.
- 5.3.4 Building 1 has the potential to support small numbers of summer roosting bats. As a result, the demolition of the building may result in the destruction of potential roosting sites, which would result in an offence under the legislation highlighted above. This impact has been addressed as part of the accompanying bat report.

5.4 Reptiles

- 5.4.1 All British reptiles are protected under the Wildlife and Countryside Act 1981 (as amended by the CRow Act 2000). Grass snake, slow worm, common lizard, and adder, are protected against intentional killing or injury and against sale. In addition, all British reptiles are UK Biodiversity Action Plan species and are listed as Species of Principal Importance under the provision of the NERC Act 2006.
- 5.4.2 Reptiles have been recorded on and close to the site in the past and as such the proposed development may result in an offence under the legislation highlighted above.

5.5 Great Crested Newts

- 5.5.1 Great crested newts and their habitats in water and on land are protected under the Wildlife and Countryside Act 1981 (as amended by the CRow Act 2000) and under the Conservation of Habitats and Species Regulations 2010. Taken together, these make it an offence to:
- a) Deliberately capture, injure or kill a great crested newt;
 - b) Deliberately disturb any great crested newt, 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.
 - c) To be in possession or control of any live or dead great crested newt or any part of, or anything derived from a great crested newt;
 - d) Damage or destroy a breeding site or resting place of a great crested newt;
 - e) Intentionally or recklessly obstruct access to any place that a great crested newt uses for shelter or protection;
 - f) Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place that it uses for shelter or protection.

- 5.5.2 In addition, great crested newt is a UK Biodiversity Action Plan species and is listed as a Species of Principal Importance under the provisions of the NERC Act 2006.
- 5.5.3 Great crested newts have been recorded on and adjacent to the site in the past and as such the proposed development may result in an offence under the above legislation.

5.6 Badgers

- 5.6.1 Badgers are protected under the Badgers Act 1992. This makes it an offence to willfully 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. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. Removal of significant areas of badger foraging habitat may also contravene the Act, as it could be regarded as cruelty.
- 5.6.2 No evidence of badgers was recorded during the survey however badgers are highly mobile animals and may colonise the site and as such a precautionary approach should be undertaken to ensure that an offence will not occur under the above legislation.

5.7 Birds

- 5.7.1 All nesting birds are protected under the Wildlife and Countryside Act 1981, which makes it an offence to kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition to this, for some rare species (listed on Schedule 1 of the Act), it is an offence to disturb them while they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.
- 5.7.2 A number of bird species are also listed as Species of Principal Importance under the provisions of the NERC Act 2006. The National Planning Policy Framework (NPPF) (paragraph 117) encourages that local authorities to take measures to “promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species” linking to national and local targets through local planning policies. Planning authorities have a duty under Section 40 of the NERC Act to have regard to priority species and habitats in exercising their functions including development control and planning.
- 5.7.3 Evidence of nesting birds has been recorded within Buildings 4 (barn owl) and it is likely that the woodland and scrub habitat on site will support other species of nesting birds. Birds may use some of the other structures and habitats for nesting and therefore, should the site undergo major redevelopment during the breeding bird season, then an offence will occur under the legislation above. In addition, without further survey it is not possible to comply with the NPPF to encourage the recovery of priority species within the site and surrounding area.

5.8 Invasive Species

- 5.8.1 Under the Section 14(1) of the Wildlife and Countryside Act 1981 it is illegal to plant or otherwise cause to grow in the wild any plant listed in Schedule 9. Plants listed under schedule 9 including Japanese knotweed.
- 5.8.2 Although no Japanese knotweed has been recorded on the site a stand has been noted close to the site boundary. It is possible that the root system falls within the site and any disturbance may cause the plant to recolonise and spread resulting in an offence under the legislation highlighted above.

6 Impacts and Recommendations

6.1 Habitats

- 6.1.1 It should be noted that within the site there are a number of habitats which fall within the UK and Local BAP, these include ponds and mosaic habitat on previously developed land.

Ponds

- 6.1.2 Ponds have been considered when designing mitigation and compensation. As Ponds 1 and 2 are artificial settling lagoons on the Biodiversity Metric pond condition sheet, the current condition assessment of both of these ponds is classed as being poor. Pond 4 has a moderate score under the condition assessment. Under current guidance it is recommended that new pond habitat is created. As such replacement ponds will be close to the existing settling lagoons and will be managed for wildlife purposes. Details of this can be found in the accompanying great crested newt report and ES.

Mosaic habitat on previously developed land

- 6.1.3 The mosaic habitat on previously developed land has begun to appear as works to the site are reduced, allowing pioneer species to colonise. As a result these habitats are relatively new and have not yet developed fully. Using the Biodiversity Metric Urban Condition sheet the current condition assessment is classed as being poor. Under current guidance it is recommended that like for like habitat is created. It may be possible to create a large area of this habitat on the area of poor neutral grassland to the south of the study site. A mitigation scheme could be undertaken based on a case study undertaken by BSG Ecology (2015), whereby inert, loose brick and rubble material is spread around the proposed habitat creation area. In addition, rubble and log piles should also be installed on the site to attract additional fauna. No seeding should be undertaken but the site should be allowed to recolonise naturally.

6.2 Bats

Roosts

- 6.2.1 Building 1 has been identified as having low potential to support small numbers of bats, as such a single dusk/dawn survey is required during the summer months to ascertain if bats are using this building for roosting. This work has been carried out and the results and recommendations can be seen within the accompanying bat survey report.

Commuting and foraging

- 6.2.2 To understand how bats are using the study site (so as to reduce impacts during and after the development), current guidance set out by the Bat Conservation Trust (2016) states that bat activity surveys should be carried out where development proposals are likely to impact on commuting and foraging bats.
- 6.2.3 The site has been classified as having moderate potential suitability to support commuting and foraging habitats on site. This is due to existing habitats which connect directly to the wider landscape which could be used by commuting or foraging bats, specifically, scrub woodland and open water habitats. This assessment has been based on current guidance set in Table 4.1 by the Bat Conservation Trust (2016).
- 6.2.4 The majority of the central part of the site consists of bare ground, resulting in the majority of the study site being classed as having negligible potential for supporting roosting bats. The eastern boundary is of low potential for commuting bats based on the lack of vegetation for much of this section and its location alongside a busy well-lit road. The northern, western and

southern boundaries of the study site fall into a moderate category as these boundaries connect to the wider landscape. The small strip of woodland to the north (which will not form part of any formal development) is classed as being of moderate potential as the features associated with the woodland strip connect directly with higher quality habitat such as the edge of woodlands and a wetland/canal corridor. Therefore, the site has been considered to be of moderate potential for commuting and foraging bats.

- 6.2.5 Based on data supplied by South Yorkshire Bat Group and the Barnsley biological Records Centre there are currently a number of roosting sites around the study site. The largest of these roosts was recorded as being 200 metres to the east of the study site. Subsequent contact with the SYBG questioning the location of this roost (as there are no obviously buildings or features suitable for roosting) showed that the grid reference was incorrect on this particular roost and is actually located further away from the study site, although an exact location is not currently known. The majority of other bat roosts are located over 600 metres from the study site. The knowledge of roosts around the study site does not increase or decrease the sites suitability for commuting or foraging bats within the study site.

Table 4.1 Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement.

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions^a and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation^b).</p> <p>A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.^c</p>	<p>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.</p> <p>Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.</p>
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ^a and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions ^a and surrounding habitat.	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>

- 6.2.6 Table 8.3 taken directly from the Bat Conservation Trust Bat Survey Guidance (2016) identifies that a single transect and the installation of two data loggers between the months of April and September/October will be necessary to identify how bats are using the site and will give enough information to provide suitable mitigation and compensation.
- 6.2.7 A separate bat survey and activity report have been created to accompany this document.

Table 8.3 Guidelines on the number of bat activity surveys recommended to achieve a reasonable survey effort in relation to habitat suitability.

Survey type	Low suitability habitat for bats ^a	Moderate suitability habitat for bats	High suitability habitat for bats
Transect/spot count/timed search surveys	One survey visit ^b per season (spring – April/May, summer – June/July/August, autumn – September/October) ^c in appropriate weather conditions for bats Further surveys may be required if these survey visits reveal higher levels of bat activity than predicted by habitat alone	One survey visit ^b per month (April to October) ^c in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period.	Up to two survey visits ^b per month (April to October) ^c in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period.
AND			
Automated/static bat detector surveys ^d	One location per transect, data to be collected on five consecutive nights per season (spring – April/May, summer – June/July/August, autumn – September/October) ^c in appropriate weather conditions for bats	Two locations per transect, data to be collected on five consecutive nights per month (April to October) ^c in appropriate weather conditions for bats	Three locations per transect, data to be collected on five consecutive nights per month (April to October) ^c in appropriate weather conditions for bats

6.3 Amphibians

- 6.3.1 Great crested newts have been recorded close to and on the site during previous surveys however, these works were carried out over 4 years ago. To ascertain presence/absence of species, as well as local populations, it is recommended that a great crested newts survey is carried out. This survey will need to include all ponds within the development site as well as those within a 500-metre radius. It is recommended that prior to surveys being carried out visits to all ponds within this area are undertaken and the ponds assessed as to their suitability to support great crested newts.
- 6.3.2 The above surveys have been carried out in 2020 and the results and proposed recommendations can be seen in the accompanying great crested newt report.

6.4 Reptiles

- 6.4.1 Although no reptiles have been recorded during the survey works, reptiles have been recorded in the past on the site and are present on land adjacent to the study site. Consultation with the Barnsley City Council Ecologist as to further survey work resulted in the recommendation that no further survey work would be necessary in this instance. That being said, a mitigation strategy should be developed to ensure that reptiles are not injured or killed during the proposed works and that suitable mitigation and compensation are undertaken.
- 6.4.2 Although a population estimate has not been carried out for the study site since 2013, the majority of the site is sub-optimal to support grass snakes. Areas around the settling lagoons to the north of the study site and around the scrub to the north east of the site have the best potential for grass snakes.
- 6.4.3 It is likely that a trapping scheme to coincide with the great crested newt trapping would need to be carried out in specific parts of the site, namely the eastern area which connects directly with Rabbit Ing's Country Park and the area around the lagoons to the north. Trapping will involve the erection of amphibian and reptile fencing with basking tins or mats within these areas to capture and translocate any animals. Although there is scope for the translocation of reptiles within the study site, it may be more beneficial to translocate reptiles to Rabbit Ings Country Park or to Ellis Laihe LWS to the north until the new on-site habitats become suitably established. Additional habitat creation in the form of log piles could be installed should the respective land managers be accepting of this arrangement. It is recommended that the new habitat creation of mosaic habitat on previously developed land which is proposed for the

south west corner could incorporate some of these features and be used as a translocation point as this links directly with the rail corridor and the former canal LWS.

6.5 Badgers

- 6.5.1 Although no direct evidence of badger has been recorded on site, they are known to be within the surrounding area. It is therefore recommended that, prior to any development, a check for badgers is undertaken to ensure that they have not colonised the site prior to works. In addition, any open trenches should be graded to allow any animals that may fall in to escape.

6.6 Birds

- 6.6.1 To fully understand the bird assemblage within the site and to give appropriate mitigation and compensation recommendations a breeding bird survey was undertaken between March and June 202.
- 6.6.2 Breeding bird surveys require suitably qualified ecologists to walk a pre-determined transect in the morning or early evening between five and seven times during the breeding bird period (March to June). A breeding bird survey report has been created following the above recommended survey technique to accompany this document.

6.7 Invasive Species

- 6.7.1 Japanese knotweed has been recorded just outside of the site boundary. Should this area be developed it may be worth considering removal of this species or placing a barrier to stop the plant from spreading onto the site. Further information should be sought from a specialist contractor.

7 References

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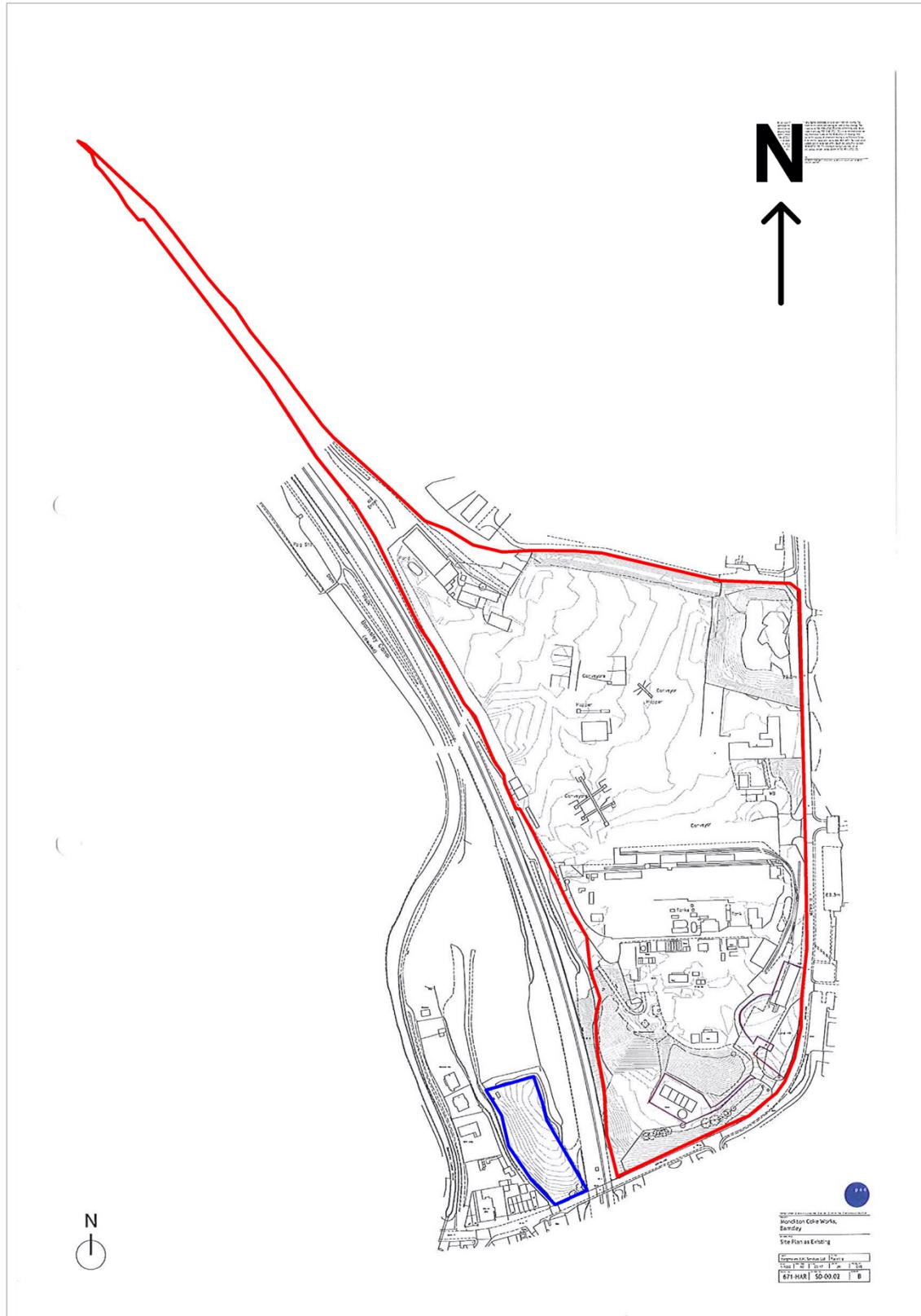
Mitchell-Jones, A J (2004) Bat mitigation Guidelines. English Nature.

Oldham R S, Keeble J, Swan M J S, Jeffcote M (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). Herpetological Journal, 10, 143-155

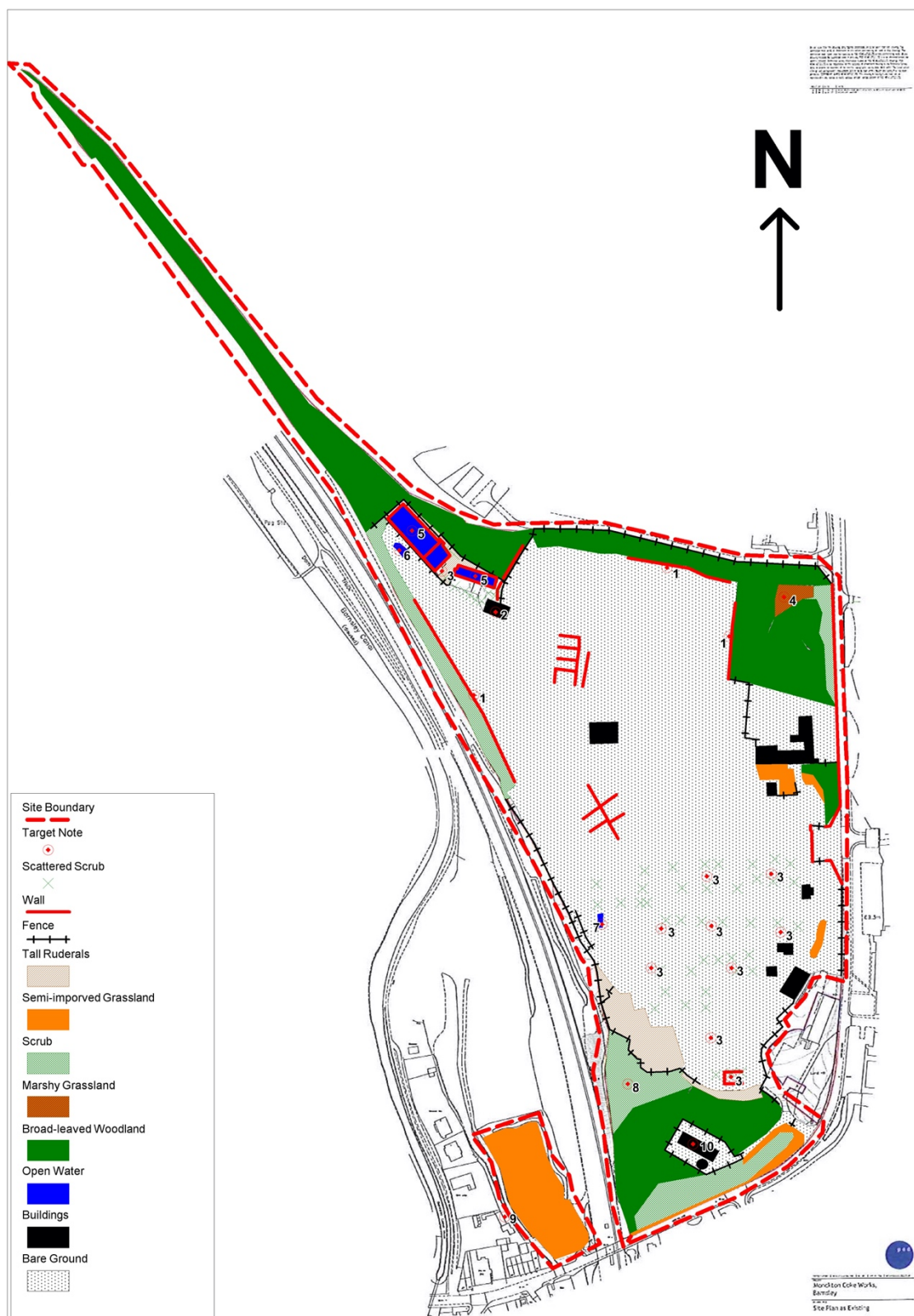
Sewell D, Griffiths R A, Beebee T J C, Foster J and Wilkinson J W (2013) Survey Protocols for the British herpetofauna.

8 Figures

8.1 Figure 1: Red and Blue Line Boundary



8.2 Figure 2: Phase 1 Habitat Survey Plan



Target Notes

Target Note 1

Wall made from stacked, discarded truck tyres. Trees and shrubs have colonised these as large plant pots.

Target Note 2

Building 4 contained a single Barn owl at the time of survey. Barn owl pellets were present at the entrance.

Target Note 3

Rubble piles. These are too numerous throughout the site to record them all, however the major piles have been labelled at TN3

Target Note 4

Area of wet grassland and likely a former pond.

Target Note 5

Two settling lagoons with potential to support great crested newts.

Target Note 6

Small naturalised pond with potential to support great crested newts.

Target Note 7

Small pond, possibly not permanent, has limited potential to support great crested newts.

Target Note 8

Dense scrub and steep bank leading to railway cutting. Limited access to this part of the site for health and safety reasons.

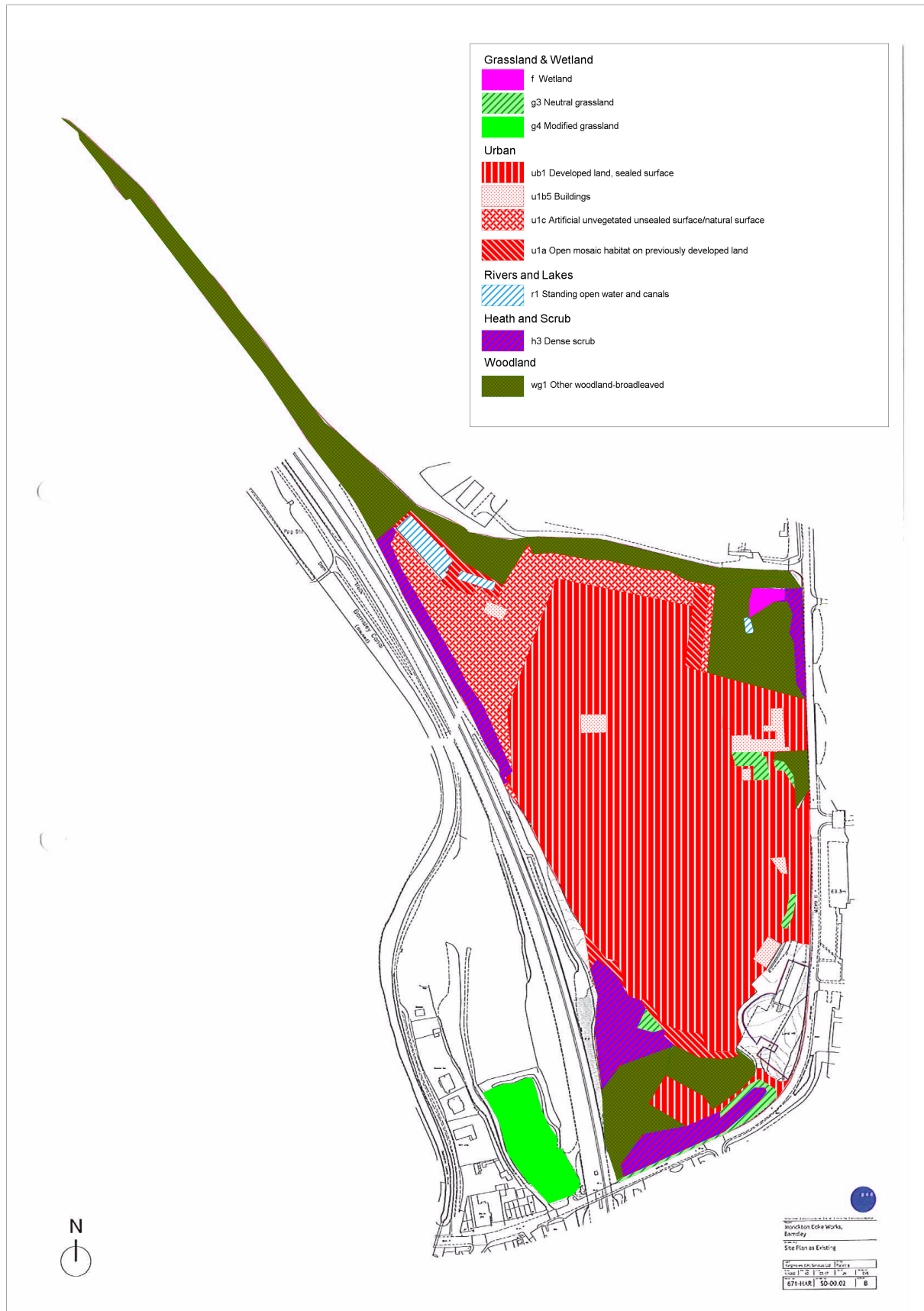
Target Note 9

Stand of Japanese knotweed

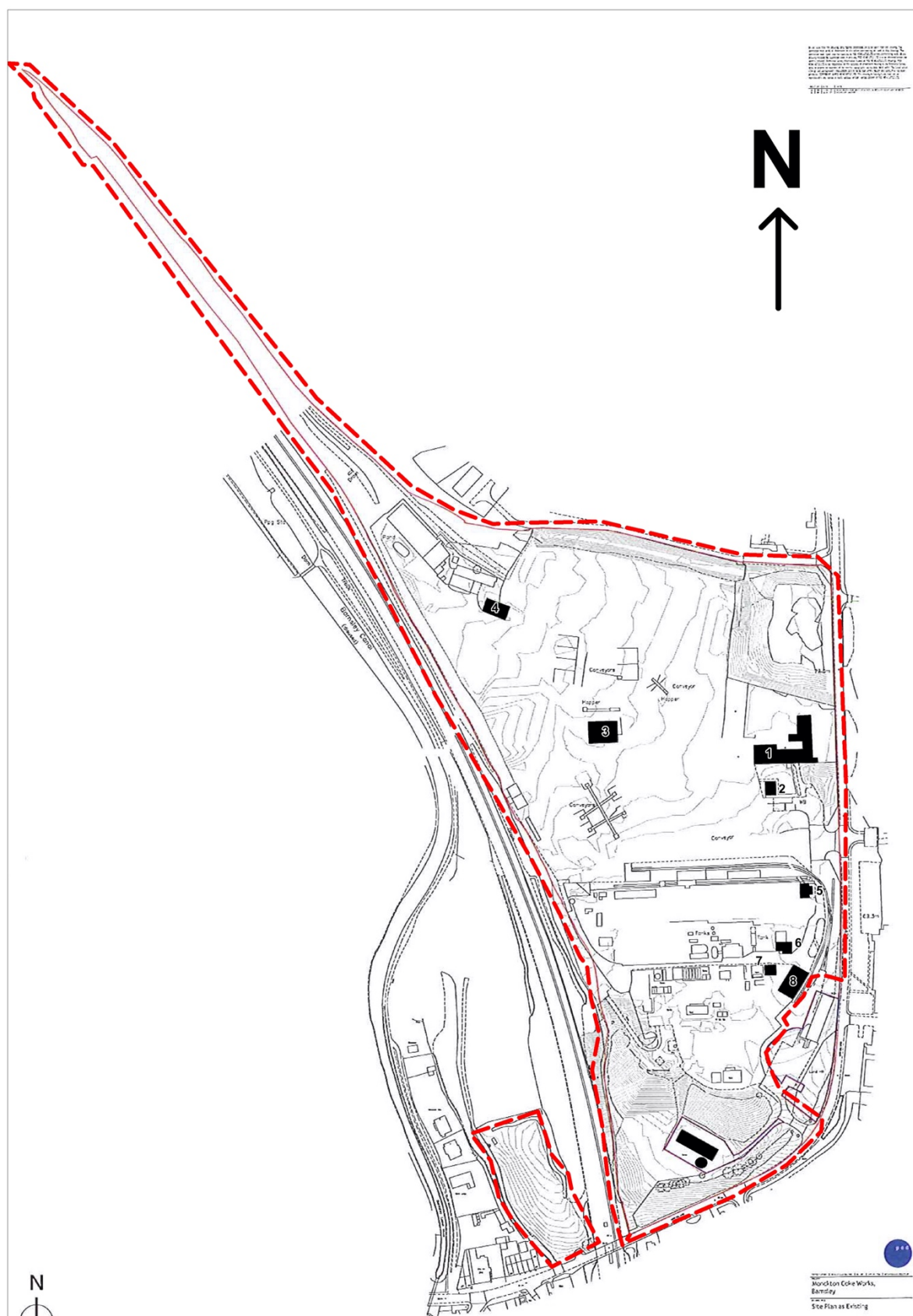
Target Note 10

Water treatment works, limited access.

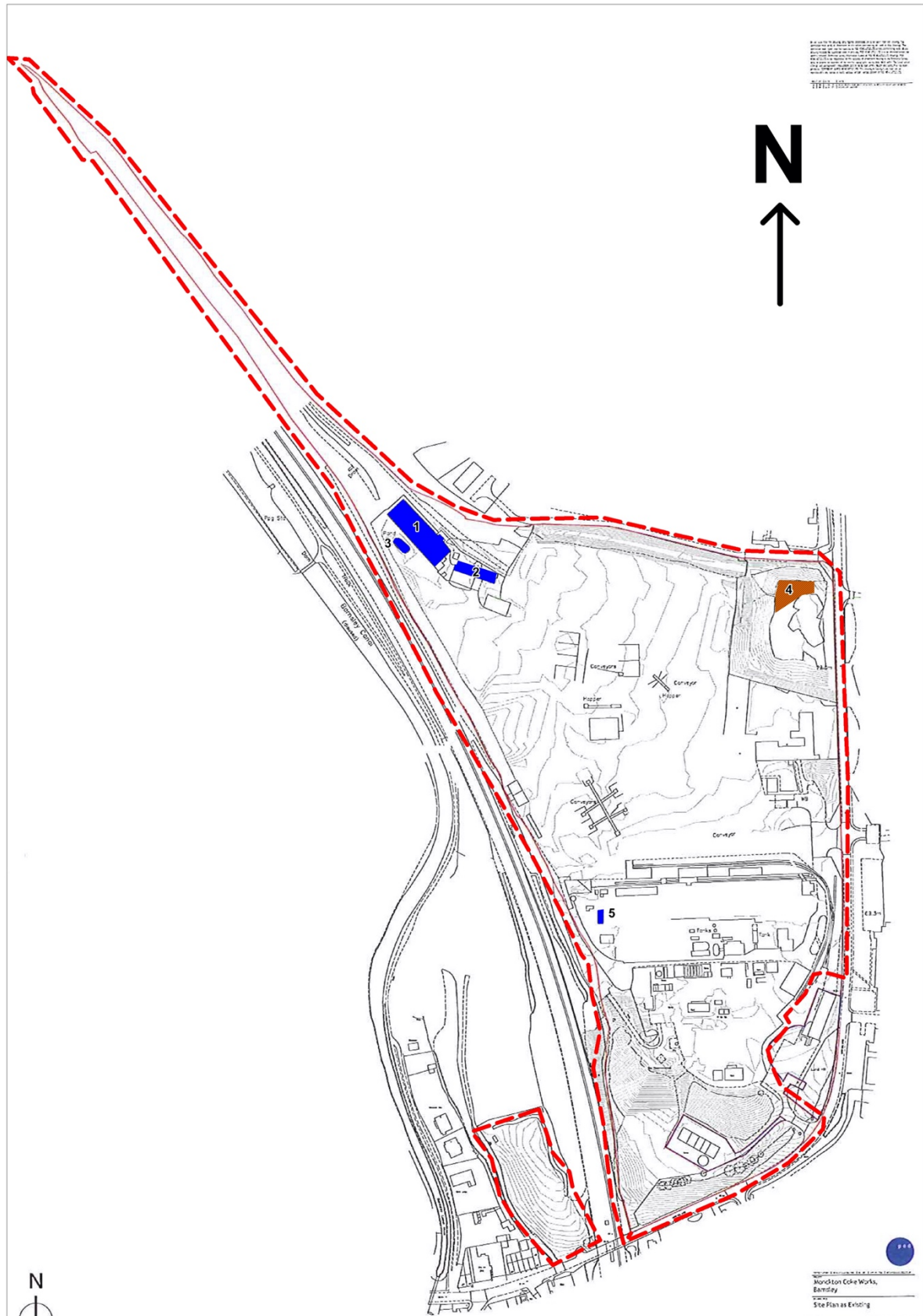
8.3 Figure 3: UK Habitat Classification Map



8.4 Figure 4: Building Numbers



8.5 Figure 5: Pond Numbers within the site boundary



Appendix A Desk Study Information

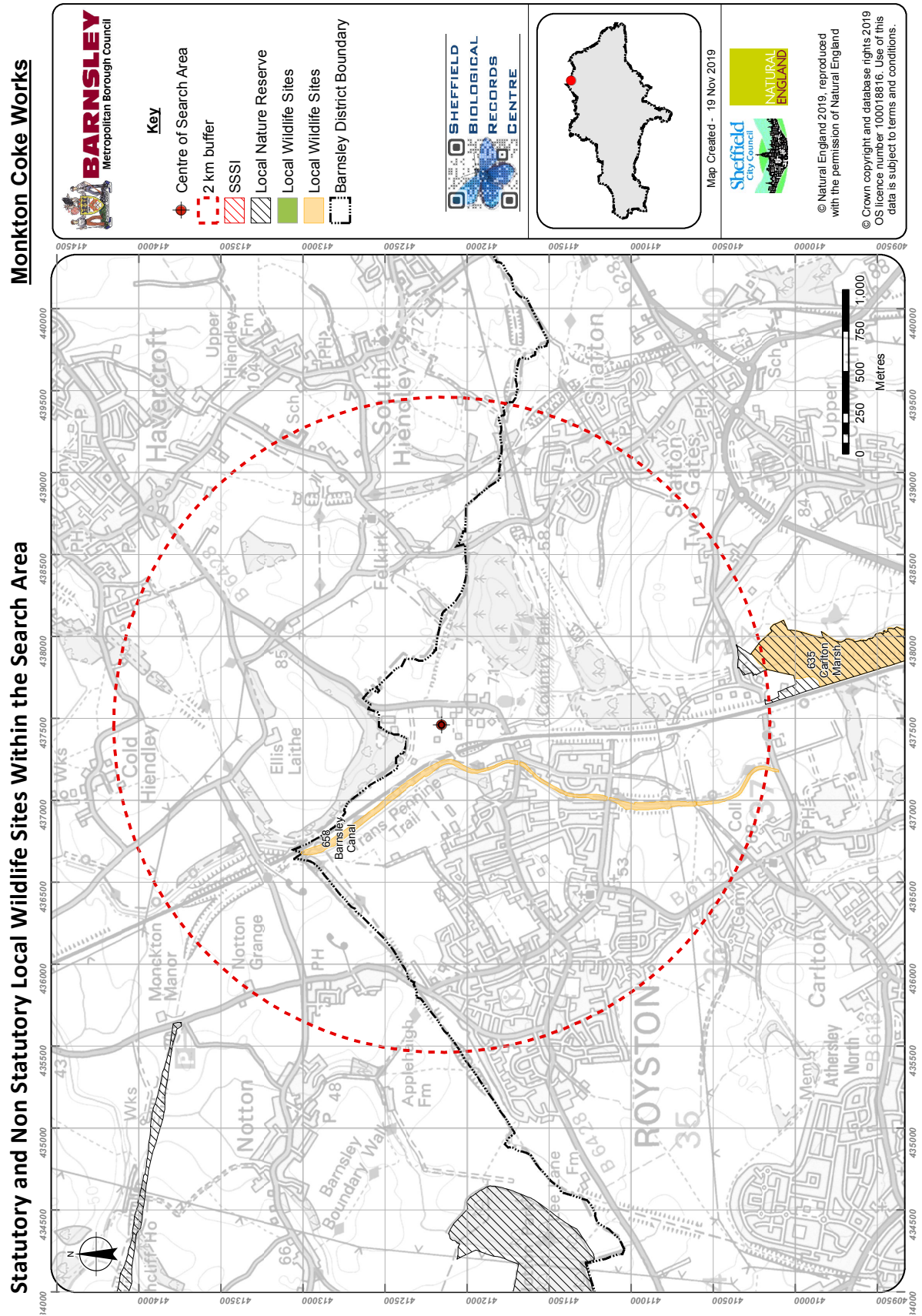
A.1.1 SBRC provided too many results to display in this report (8665), a bird species list for the search area has been included. In addition, many of the records are of a sensitive nature and should not be placed in the public domain. These results have therefore been omitted from this report.

A.2 Bird Species recorded within the search area, provided by SBRC.

Common Name	Scientific Name	Common Name	Scientific Name
Arctic Skua	<i>Stercorarius parasiticus</i>	Manx Shearwater	<i>Puffinus puffinus</i>
Arctic Tern	<i>Sterna paradisaea</i>	Marsh Harrier	<i>Circus aeruginosus</i>
Bar-tailed Godwit	<i>Limosa lapponica</i>	Marsh Tit	<i>Parus palustris</i>
Barn Owl	<i>Tyto alba</i>	Meadow Pipit	<i>Anthus pratensis</i>
Barnacle Goose	<i>Branta leucopsis</i>	Mealy Redpoll	<i>Carduelis flammea</i> subsp. <i>flammea</i>
Bewick's Swan	<i>Cygnus columbianus</i>	Mediterranean Gull	<i>Larus melanocephalus</i>
Bittern	<i>Botaurus stellaris</i>	Merlin	<i>Falco columbarius</i>
Black-Headed Gull	<i>Larus ridibundus</i>	Mistle Thrush	<i>Turdus viscivorus</i>
Black-Tailed Godwit	<i>Limosa limosa</i>	Mute Swan	<i>Cygnus olor</i>
Blackbird	<i>Turdus merula</i>	Osprey	<i>Pandion haliaetus</i>
Brambling	<i>Fringilla montifringilla</i>	Oystercatcher	<i>Haematopus ostralegus</i>
Brent Goose	<i>Branta bernicla</i>	Peregrine	<i>Falco peregrinus</i>
British Lesser Black-Backed Gull	<i>Larus fuscus</i> subsp. <i>graellsii</i>	Pied Flycatcher	<i>Ficedula hypoleuca</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>	Pink-Footed Goose	<i>Anser brachyrhynchus</i>
Common (Mealy) Redpoll	<i>Acanthis flammea</i>	Pintail	<i>Anas acuta</i>
Common Gull	<i>Larus canus</i>	Pochard	<i>Aythya ferina</i>
Common Sandpiper	<i>Actitis hypoleucos</i>	Quail	<i>Coturnix coturnix</i>
Common Scoter	<i>Melanitta nigra</i>	Red Kite	<i>Milvus milvus</i>
Common Tern	<i>Sterna hirundo</i>	Redpoll	<i>Carduelis flammea</i>
Cormorant	<i>Phalacrocorax carbo</i>	Redshank	<i>Tringa totanus</i>
Corn Bunting	<i>Miliaria calandra</i>	Redstart	<i>Phoenicurus phoenicurus</i>
Crane	<i>Grus grus</i>	Redwing	<i>Turdus iliacus</i>
Cuckoo	<i>Cuculus canorus</i>	Reed Bunting	<i>Emberiza schoeniclus</i>
Curlew	<i>Numenius arquata</i>	Ring Ouzel	<i>Turdus torquatus</i>
Dartford Warbler	<i>Sylvia undata</i>	Ringed Plover	<i>Charadrius hiaticula</i>
Dunlin	<i>Calidris alpina</i>	Ruff	<i>Philomachus pugnax</i>
Duncock	<i>Prunella modularis</i>	Sand Martin	<i>Riparia riparia</i>
Fieldfare	<i>Turdus pilaris</i>	Sandwich Tern	<i>Sterna sandvicensis</i>
Firecrest	<i>Regulus ignicapillus</i>	Shelduck	<i>Tadorna tadorna</i>
Gadwall	<i>Anas strepera</i>	Short-eared Owl	<i>Asio flammeus</i>
Garganey	<i>Anas querquedula</i>	Shoveler	<i>Anas clypeata</i>
Glaucous Gull	<i>Larus hyperboreus</i>	Skylark	<i>Alauda arvensis</i>
Goldcrest	<i>Regulus regulus</i>	Snipe	<i>Gallinago gallinago</i>
Golden Plover	<i>Pluvialis apricaria</i>	Snipe	<i>Gallinago gallinago</i>
Goldeneye	<i>Bucephala clangula</i>	Song Thrush	<i>Turdus philomelos</i>
Goldfinch	<i>Carduelis carduelis</i>	Spotted Crake	<i>Porzana porzana</i>
Goshawk	<i>Accipiter gentilis</i>	Spotted Flycatcher	<i>Muscicapa striata</i>
Grasshopper Warbler	<i>Locustella naevia</i>	Spotted Redshank	<i>Tringa erythropus</i>
Great Black-backed Gull	<i>Larus marinus</i>	Starling	<i>Sturnus vulgaris</i>
Green Sandpiper	<i>Tringa ochropus</i>	Stock Dove	<i>Columba oenas</i>
Green Woodpecker	<i>Picus viridis</i>	Storm Petrel	<i>Hydrobates pelagicus</i>
Greenshank	<i>Tringa nebularia</i>	Swallow	<i>Hirundo rustica</i>
Grey Partridge	<i>Perdix perdix</i>	Swift	<i>Apus apus</i>
Grey Plover	<i>Pluvialis squatarola</i>	Tawny Owl	<i>Strix aluco</i>
Grey Wagtail	<i>Motacilla cinerea</i>	Tree Pipit	<i>Anthus trivialis</i>
Greylag Goose	<i>Anser anser</i>	Tree Sparrow	<i>Passer montanus</i>
Hawfinch	<i>Coccothraustes coccothraustes</i>	Treecreeper	<i>Certhia familiaris</i>
Hen Harrier	<i>Circus cyaneus</i>	Tufted Duck	<i>Aythya fuligula</i>
Herring Gull	<i>Larus argentatus</i>	Turtle Dove	<i>Streptopelia turtur</i>

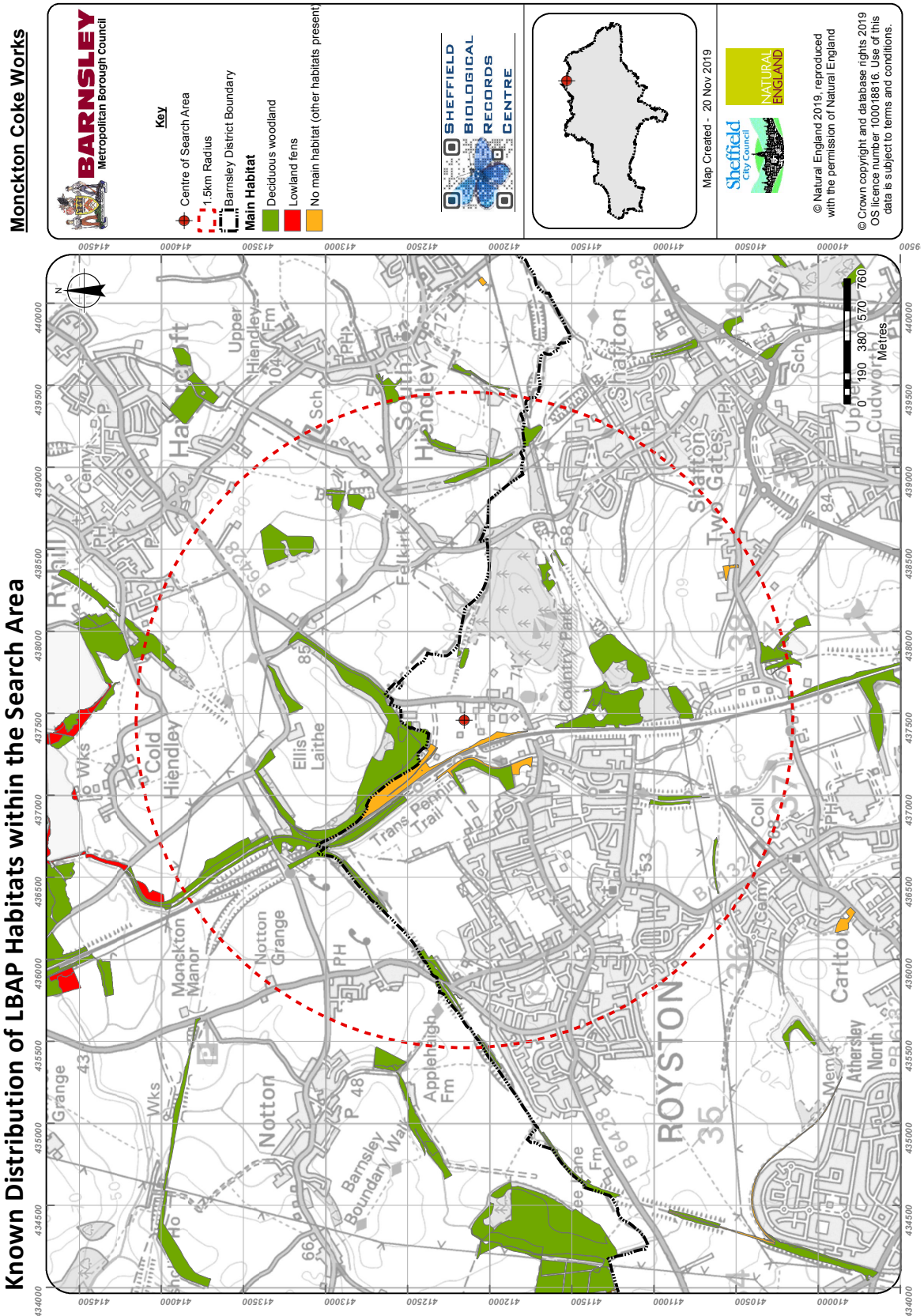
Common Name	Scientific Name	Common Name	Scientific Name
Hobby	Falco subbuteo	Water Pipit	Anthus spinoletta
Honey Buzzard	Pernis apivorus	Water Rail	Rallus aquaticus
House Martin	Delichon urbica	Waxwing	Bombycilla garrulus
House Sparrow	Passer domesticus	Wheatear	Oenanthe oenanthe
Iceland Gull	Larus glaucoides	Whimbrel	Numenius phaeopus
Jack Snipe	Lymnocyrtus minimus	Whinchat	Saxicola rubetra
Kestrel	Falco tinnunculus	Whooper Swan	Cygnus cygnus
Kingfisher	Alcedo atthis	Wigeon	Anas penelope
Kittiwake	Rissa tridactyla	Willow Tit	Poecile montana
Lapwing	Vanellus vanellus	Willow Warbler	Phylloscopus trochilus
Lesser Black-Backed Gull	Larus fuscus	Wood Sandpiper	Tringa glareola
Lesser Redpoll	Acanthis cabaret	Woodcock	Scolopax rusticola
Linnet	Carduelis cannabina	Yellow Wagtail	Motacilla flava
Little Egret	Egretta garzetta	Yellow-legged Gull	Larus michahellis
Little Ringed Plover	Charadrius dubius	Yellowhammer	Emberiza citrinella
Little Tern	Sterna albifrons		

A.3 Local Wildlife Sites provided by SBRC



A.4 LBAP Habitats provided by SBRC

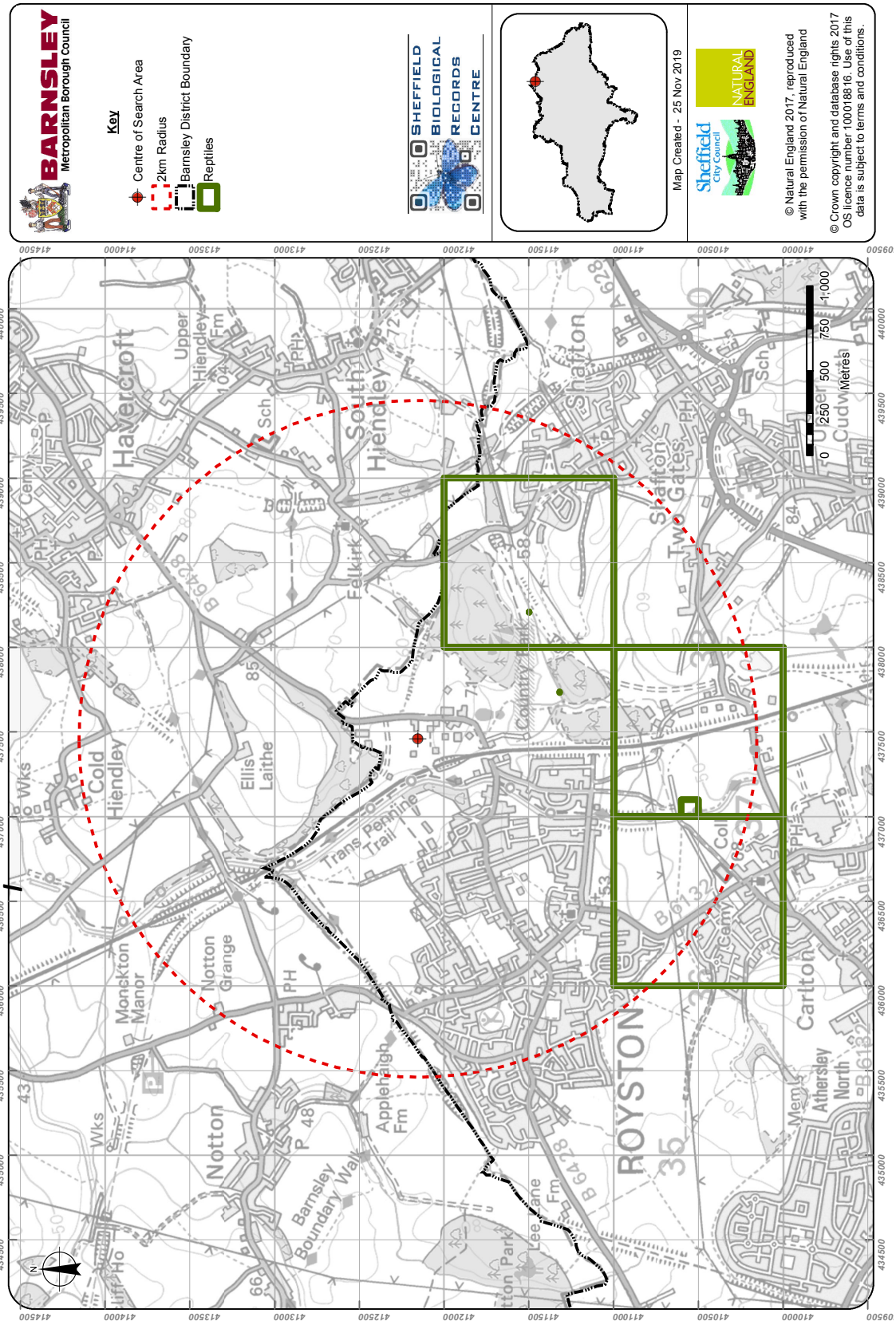
Known Distribution of LBAP Habitats within the Search Area



A.5 Known Reptile Records Provided by SBRC

Known Distribution of a Selected Species Within Search Area: Reptiles

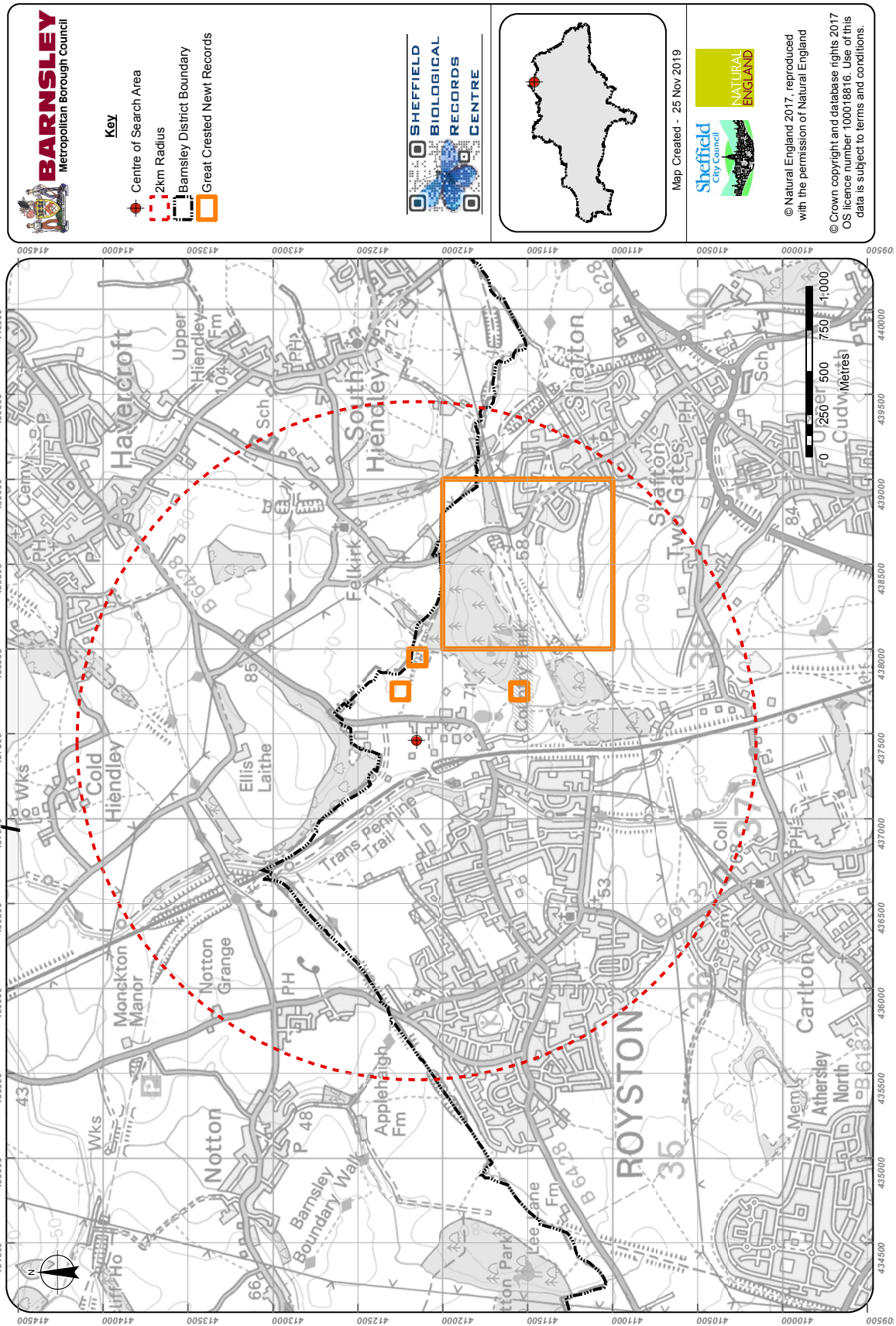
Monckton Coke Works



A.6 Known Amphibian Records Provided by SBRC

Known Distribution of a Selected Species Within Search Area: *Great Crested Newt*

Monckton Coke Works



A.7 Results Provided by South Yorkshire Bat Group

Date	GridRef6Fig	Species_UNI	Number
09/07/2012	SE357117	Common pipistrelle	1
07/08/2012	SE357117	Common pipistrelle	1
09/07/2014	SE359113	Common pipistrelle	1
31/05/1994	SE350115	Noctule	1
31/05/1994	SE350115	Pipistrelle sp.	3
31/05/1994	SE350115	Pipistrelle sp.	3
02/08/2000	SE354118	Vespertilionidae	+ Dr
02/08/2000	SE354118	Vespertilionidae	Unknown
29/09/2015	SE357117	Pipistrelle sp.	1
11/01/2016	SE357117	Pipistrelle sp.	1
16/06/2005	SE357118	Pipistrelle sp.	1-2
16/06/2005	SE357118	Vespertilionidae	Unknown
31/08/2010	SE358113	Vespertilionidae	Unknown
27/04/2006	SE351129	Vespertilionidae	Unknown
22/05/1989	SE350131	Leisler's bat	23
27/08/2015	SE360109	Pipistrelle sp.	1
19/04/1988	SE360100	Pipistrelle sp.	1
01/08/1990	SE360100	Pipistrelle sp.	1
27/07/1991	SE360100	Pipistrelle sp.	1
29/04/1998	SE360100	Pipistrelle sp.	1
20/07/1991	SE363106	Pipistrelle sp.	1
20/11/1995	SE363106	Pipistrelle sp.	1
20/06/1992	SE364104	Pipistrelle sp.	1
17/07/2016	SE366102	Whiskered bat	1
2004	SE367100	Vespertilionidae	Present
	SE367100	Vespertilionidae	1
21/04/2018	SE360110	Common pipistrelle	1
27/08/2014	SE362114	Common pipistrelle	1
27/08/2014	SE362114	Common pipistrelle	1
29/09/2014	SE362114	Whiskered bat	1
06/12/2009	SE362119	Pipistrelle sp.	dr
18/05/1988	SE363116	Pipistrelle sp.	1
06/11/2009	SE362119	Pipistrelle sp.	0
15/04/1990	SE379103	Daubenton's bat	5
02/08/1990	SE370100	Pipistrelle sp.	1
16/04/1987	SE379103	Noctule	1
16/04/1987	SE379103	Pipistrelle sp.	3
22/04/1987	SE379103	Pipistrelle sp.	4
19/06/1987	SE379103	Noctule	1
19/06/1987	SE379103	Pipistrelle sp.	3
16/09/1987	SE379103	Pipistrelle sp.	1
06/07/1988	SE379103	Noctule	2
06/07/1988	SE379103	Pipistrelle sp.	2
16/05/1989	SE379103	Noctule	2
16/05/1989	SE379103	Pipistrelle sp.	1
05/07/1989	SE379103	Noctule	1
05/07/1989	SE379103	Pipistrelle sp.	1
12/04/1990	SE379103	Pipistrelle sp.	1
15/04/1990	SE379103	Pipistrelle sp.	1
22/04/1990	SE379103	Pipistrelle sp.	1
01/05/1990	SE379103	Noctule	1

29/04/1993	SE379103	Pipistrelle sp.	4
10/05/1995	SE379103	Daubenton's bat	2
28/04/2001	SE379103	Daubenton's bat	5
02/07/1995	SE370111	Pipistrelle sp.	42
02/07/1995	SE370111	Vespertilionidae	42
03/07/1995	SE370111	Pipistrelle sp.	4
14/06/2011	SE371114	Bat (species unknown)	2
28/06/2012	SE371114	Vespertilionidae	2
28/06/2012	SE371114	Bat (species unknown)	2
17/07/2014	SE371114	Bat (species unknown)	2
31/05/2007	SE372111	Pipistrelle sp.	Unknown
14/07/2006	SE373112	Vespertilionidae	Unknown
17/09/2002	SE377113	Vespertilionidae	Unknown
19/09/2002	SE377113	Vespertilionidae	Unknown
11/08/2000	SE373131	Vespertilionidae	Unknown
05/06/2006	SE381130	Common pipistrelle	Unknown
02/07/2004	SE383141	Pipistrelle sp.	1 + dr
01/06/2015	SE391113	Common pipistrelle	1
04/07/2011	SE397125	Vespertilionidae	57
23/04/2009	SE390127	Brown long-eared bat	5

Appendix B Previous Reports

B.1 Reptile Survey by AES-LTD