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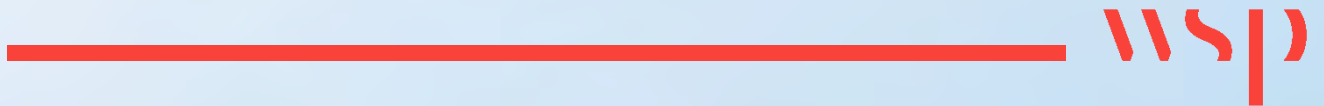
# ENVIRONMENTAL IMPACT ASSESSMENT: VOLUME 3 - APPENDICES

Chapter 9: Ecology and Nature Conservation



# V3-S09/0001

**PRELIMINARY ECOLOGICAL  
APPRAISAL (PEA)**







Energy Recovery Investments Ltd

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# **BEDWAS TIPS RECLAMATION**

Preliminary Ecological Appraisal (PEA) Report





Energy Recovery Investments Ltd

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## **BEDWAS TIPS RECLAMATION**

Preliminary Ecological Appraisal (PEA) Report

**TYPE OF DOCUMENT (VERSION) CONFIDENTIAL**

**PROJECT NO. GC4277**

**OUR REF. NO. GC4277-WSP-74-XX-RP-L-0001**

**DATE: DECEMBER 2023**

WSP

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# QUALITY CONTROL

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| Issue/revision | First issue   | Revision 1 | Revision 2 | Revision 3 |
|----------------|---|------------|------------|------------|
| Remarks        |   |            |            |            |
| Date           | 19 December 2023  |            |            |            |
| Prepared by    | Charlotte Gurney-Read / Tara Okon (Ecologist)                                       |            |            |            |
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| Signature      |  |            |            |            |
| Project number | GC4277  |            |            |            |
| Report number  | GC4277-WSP-74-XX-RP-L-0001 – P01  |            |            |            |
| File reference | GC4277-WSP-74-XX-RP-L-0001  |            |            |            |



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# EXECUTIVE SUMMARY

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Bedwas Tips Reclamation Scheme covers an extensive area (approximately 139ha) including two coal tips on Mynydd y Grug and a track route connecting the northern tip site with the A467/B4251 roundabout.

A proposed haul road route passes directly through Graig Goch Local Nature Reserve. Two non-statutory designates sites, namely Mynydd y Grug and Twyn yr Oerfel Sites of Importance for Nature Conservation (SINCS) lie partially within the Scheme area.

The proposed haul road passes directly through 15 Ancient Woodland sites and at least 40 Tree Preservation Orders (TPOs) were located within 100m of the Scheme.

Seven Priority/ probable Priority habitats comprised: lowland mixed deciduous woodland; wet woodland; hedgerows; lowland dry acid grassland; lowland heathland; ponds; and open mosaic habitats on previously developed land.

Habitats within the Scheme and surrounding area were considered suitable to support bats, dormouse, otter, great crested newt, badger, breeding birds, and a range of invertebrates. Small mammals, reptiles, amphibians, and protected and Priority plant species, bluebell, were confirmed present. Schedule 9 Wildlife and Countryside Act 1981 (as amended) (WCA) invasive non-native plant species rhododendron, Himalayan balsam, and wall cotoneaster were recorded.

Separate surveys and reports were undertaken for bats, dormouse, great crested newt, badger, breeding birds, and invertebrates.

Recommendations include production of an Ecological Method Statement (EcMS) and Construction Environmental Management Plan (CEMP), and consultation with Caerphilly County Borough Council (CCBC) county ecologist regarding loss of habitat.

Mitigation in regard to Priority habitat/Ancient Woodland, Priority and protected species and Invasive non-native plants should be in place with an appropriate supporting Method Statement.

A toolbox talk should be provided by an ecologist prior to works commencing, to include the working methods and species likely to be encountered.

Ecological enhancement opportunities include creation of wildlife ponds, cattle/sheep proof fencing, supplementary seeding, plug planting, and/or replanting with locally sourced native species, creation of brush piles for benefit of range of species and installation of bat and bird boxes.

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# 1 INTRODUCTION

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## 1.1 BACKGROUND

WSP was commissioned by Energy Recovery Investments Ltd to undertake a Preliminary Ecological Appraisal (PEA) in relation to the proposed Bedwas Tips Reclamation Scheme (the 'Scheme') situated north of Bedwas, Caerphilly Borough (Approximate Central Grid Reference: ST 17668 90526).

### SCHEME BACKGROUND & PROPOSED WORKS

The Scheme is located within 1km of Bedwas, in Caerphilly Borough and covers a large area (approximately 139ha) including two coal tips on Mynydd y Grug and a track route connecting the northern tip site with the A467/B4251 roundabout. This track route will form the proposed Haul Road.

The purpose of the works is to restore the CCBC owned degraded land of the Bedwas coal spoil tips to a more natural habitat in keeping with the surrounding area. In the process, high ash coal will be extracted from the colliery spoil which will provide the means of funding the restoration. The land is to be suitable for upland grazing, thereby enhancing the natural environment and improving the resilience of ecosystems and ecological networks by:

- Re-landscaping in keeping with the natural character of the area;
- Improving site drainage and run-off water quality;
- Improving physical ground conditions and land stability; and
- Promoting soil recovery, revegetation, and enhanced biodiversity.

The proposed development will operate over a period of approximately six years and will be conducted in the following stages:

- Construction of the following: access road, clean water pond, site bunding and water drainage channels, site water collection and treatment ponds, process plant, portable buildings for workers;
- Excavation;
- Deposition;
- Reclamation;
- Decommissioning; and
- Aftercare (5-year period).

The location of the proposed works is illustrated in Figure 1-1 and hereafter referred to as the 'Scheme'. The Scheme has been sub-divided into the 'Haul Road' and the 'Main Site', latter inclusive of the southerly tip site ('Tip 1') and the northern site ('Tip 2').

The general arrangement for the works including the two tip sites (Tip 1 and Tip 2) and the Haul Road is illustrated in Figures 1-2 and 1-3.



Figure 1-1 - Red line indicates the Haul Road and red polygon the Main Site. Blue line indicates the dividing line between Main Site and the Haul Road and yellow line indicates the survey boundary for the Scheme (Adapted from Google Earth, 2023).

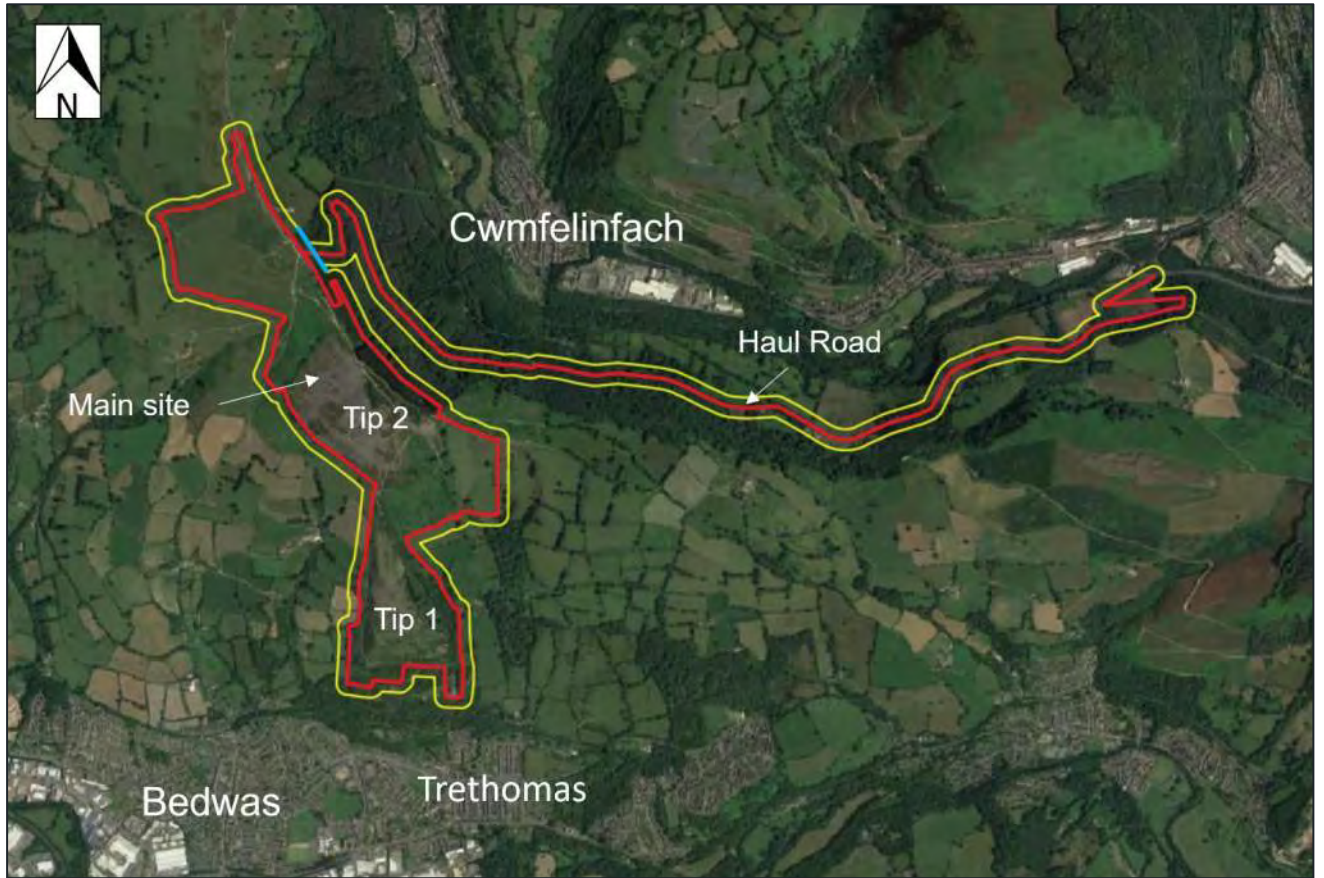
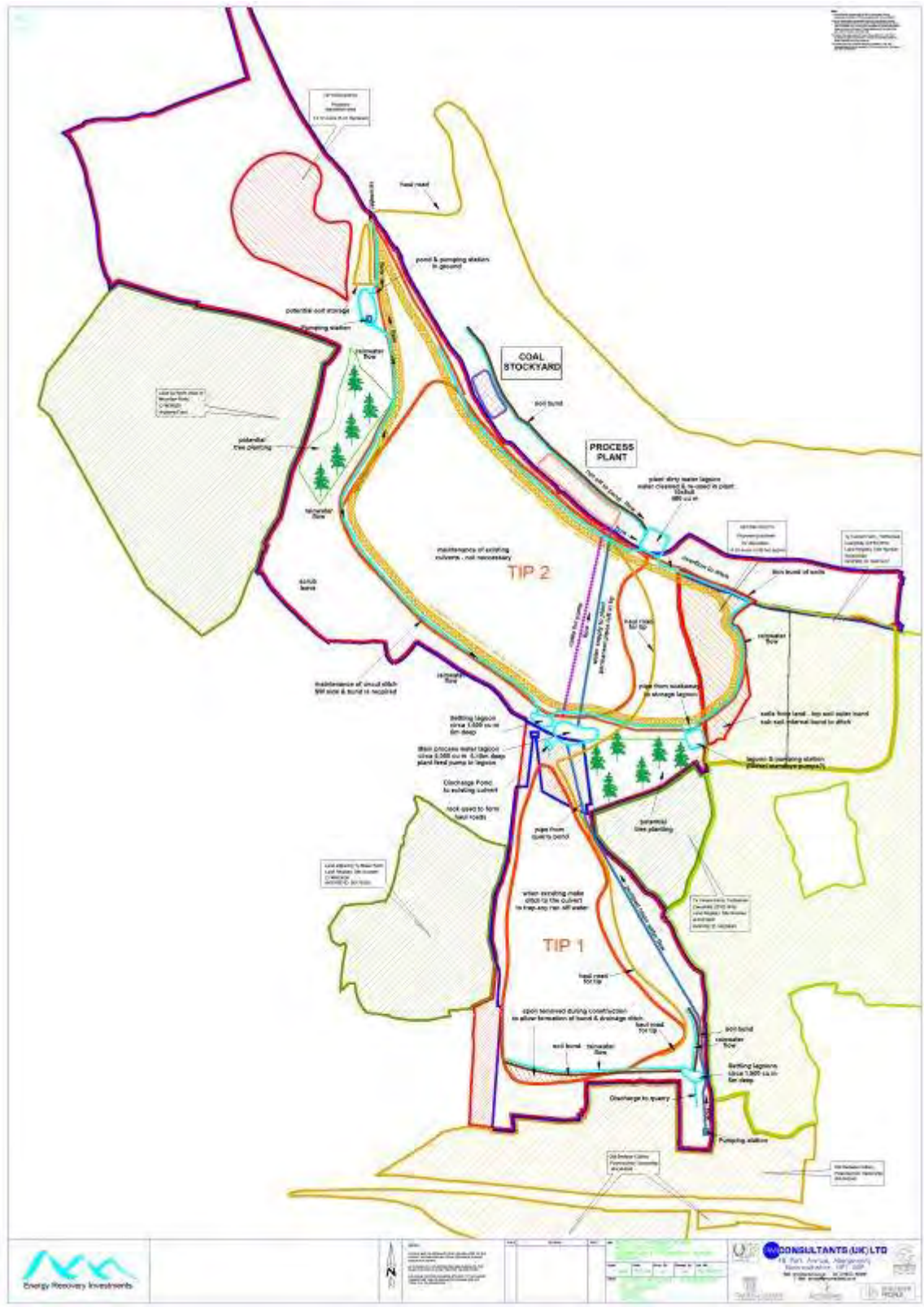
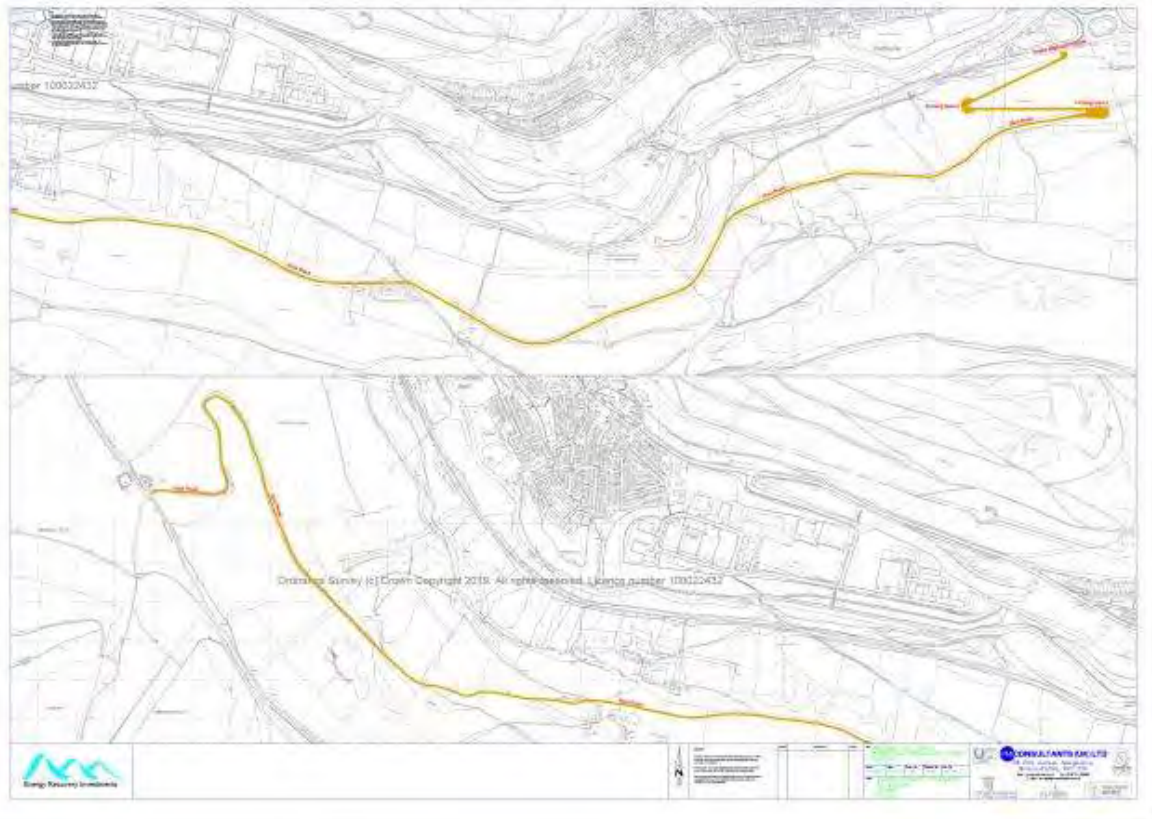


Figure 1-2 – Constructional and Operational Plan – Main Site





**Figure 1-3 - Haul Road location.**



## SITE DESCRIPTION

Colliery spoil dominated the two tip sites while the track forming the Haul Road was mainly within woodland habitats. Land use surrounding the tips comprised agricultural land with pockets of woodland and scrub, with the urban development of Bedwas town situated to the south. To the north-west of the Scheme lies the Mynydd y Grug Common, and to the north-east the Cwmfelinfach village, separated by a large strip of woodland and the Sirhowy river, which runs roughly parallel with the Haul Road to the north. The Scheme area lies partially within statutory and non-statutory designated sites.

## 1.2 SCOPE/PURPOSE OF REPORT

The brief of the PEA commission was to:

- Provide a baseline of the ecological conditions for the Scheme, with particular reference to whether legally protected and/or notable sites, species or habitats are present or likely to be present;
- Provide recommendations to enable compliance with relevant nature conservation legislation and planning policy; and
- If necessary, to identify the need for avoidance, mitigation, compensation or enhancement measures and/or further ecological surveys.

This report includes details of the survey methodologies, results and discussion and contains recommendations for further survey/ mitigation where appropriate.





### **1.3 RELEVANT LEGISLATION AND POLICY**

The appraisal has been compiled with reference to the relevant nature conservation legislation, planning policy and the UK Biodiversity Framework from which the protection of sites, habitats and species is derived in Wales, as detailed in Appendix A. The context and applicability of each item is explained as appropriate in the relevant sections of the report and additional details are presented in Appendix A.

## 2 METHODOLOGY

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### 2.1 OVERVIEW

This report has been prepared in accordance with best practice guidance as outlined in the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017).

### 2.2 DESK STUDY

A desk study was undertaken to identify ecological information relating to the Scheme and its surroundings. The following organisations/ websites were consulted during December 2022.

A request to the South East Wales Biodiversity Records Centre (SEWBRc) was made for information on any ecologically designated sites, habitats and protected species or species of conservation concern within a 1km radius (5km for bats) of the Scheme (SEWBRc, 2022). This included a request for data for priority habitats and species listed under Section 7 of the Environment (Wales) Act 2016. The results of this search are summarised in Appendix B.

The Multi-Agency Geographic Information for the Countryside (MAGIC) website (MAGIC, 2022) was accessed to search for additional statutory designated sites i.e., Special Areas of Conservation (SAC) sites specifically designated for bats.

The Natural Resources Wales online Lle Ancient Woodland (AW) Inventory via DataMapWales [Accessed December 2022] was consulted to identify AW areas within 500m of the proposed Scheme. The CCBC Tree Preservation Orders (TPOs) interactive map was consulted in December 2022 to identify TPOs within 100m of the Scheme (CCBC, 2022).

Aerial photographs and Ordnance Survey (OS) maps were reviewed to identify features with potential significance in relation to habitats and species on site.

### 2.3 EXTENDED PHASE 1 HABITAT SURVEY

WSP surveyors, Tara Okon (Ecologist) and Charlotte Gurney-Read (Assistant Ecologist), conducted the survey based on Extended Phase 1 habitat survey techniques (JNCC, 2010) on the 17, 24, 25 and 26 of January 2023. The survey consisted of a thorough walkover of the Scheme (inclusive of a 50m buffer surrounding the Scheme boundary referred to as the 'Survey Area'), mapping the habitat types and listing floral species within each habitat. Invasive plant species were also recorded. The botanical list is provided in Appendix C and nomenclature of vascular plants follows Stace (2010). The relative abundance of each vascular plant species was recorded using the **A**bundant, **C**ommon, **F**requent, **O**ccasional, **R**are (ACFOR) scale. Dominant vascular plant species were noted, as were any uncommon species or species indicative of particular habitat types, but exhaustive species lists were not compiled. Supporting survey photographs are provided in Appendix D.

Where appropriate, consideration was given to whether habitats qualify, or could qualify, as a Priority habitat under the Environment (Wales) Act (2016).

The habitats were also assessed for their potential to support protected/notable species of plants and/or animals and observation was made of any incidental signs of protected/notable species. The outputs of the surveys include Phase 1 Habitat Maps which are illustrated on Drawings GC4227-WSP-74-XX-M2-L-3010 and 3011. Target notes (TNs) are illustrated in the Phase 1 Habitat Map and detailed fully in Appendix D.



Opportunistic observations made during other ecological surveys within the Survey Area were noted and incorporated in the analysis where they provided pertinent additional information e.g., notable plant species that were not evident during the initial PEA survey.

## **2.4 PRELIMINARY EXTERNAL BAT ROOST ASSESSMENT**

WSP ecologists conducted an external inspection of trees and structures within the Survey Area during the PEA visit. Ecologists inspected any features present for potential bat access and egress points, potential roosting sites and signs of bats themselves, using binoculars and torches where appropriate.

The survey methods were based on Bat Conservation Trust guidelines (3rd Edition) (Collins, J (ed), 2016).

## **2.5 SURVEY CONSTRAINTS**

The optimal period for undertaking Extended Phase 1 habitat surveys is between April and September (inclusive). This survey took place outside of the optimal period in January, meaning that some plant species may not have been detectable. Additional observations were noted during other ecological surveys undertaken for the Scheme although some protected plant species, such as bluebell (*Hyacinthoides non-scripta*), may not have been evident.

Any ecological survey can only identify what was present in the Survey Area at the time it was conducted, and habitat use by species can change over time. The length of time that survey data remains valid is considered on a case-by-case basis, but in general if proposed works do not commence within two years of the date of the survey, an update may be required.



### 3 RESULTS

#### 3.1 DESIGNATED SITES

Designated sites identified during the desk study are detailed as follows. Statutory and Non-statutory designated sites are also illustrated on Drawing GC4277-WSP-74-XX-M2-L-0001 Designated Sites.

##### STATUTORY SITES

Two national statutory designated sites were located within 1km of the Scheme, both of which were Local Nature Reserves (LNR). A national statutory site designated for bats, a Site of Special Scientific Interest, was also located within 5km of the Scheme. Details of these sites are provided in Table 2-1.

**Table 3-1 – Statutory designated sites of European, international or UK importance within 1km (5km for bat designated sites) of the Scheme.**

| Site Name                    | Designation | Description  | Approximate distance and orientation from Scheme (km) |
|------------------------------|-------------|--|---|
| Graig Goch                   | LNR         | Ancient oak and beech woodland set in Sirhowy Valley Country Park. Contains protected/priority plant species bluebell ( <i>Hyacinthoides non-scripta</i> ) and bird species such as redstart ( <i>Phoenicurus phoenicurus</i> ) and kingfisher ( <i>Alcedo atthis</i> ). Species of bats, butterflies, moths and wildflowers have also been recorded.  | Haul Road passed directly through LNR                 |
| Flatwood Meadow              | LNR         | Two old hay meadows on banks of Sirhowy River – some of few remaining examples of species-rich grasslands in Sirhowy Valley. Diverse community of wildflowers supporting butterflies and moths such as the small pearl-bordered fritillary ( <i>Boloria selene</i> ) marsh pug ( <i>Eupithecia pygmaeata</i> ). Also contains small pond containing amphibians. Daubenton’s ( <i>Myotis daubentonii</i> ) and noctule ( <i>Nyctalus noctula</i> ) bats recorded foraging in meadow. Birds recorded include grey heron ( <i>Ardea cinerea</i> ), kingfisher, and dipper ( <i>Cinclus cinclus</i> ). | 170m north of Haul Road                               |
| Ruperra Castle and Woodlands | SSSI        | Only known nursery roost for greater horseshoe bat ( <i>Rhinolophus ferrumequinum</i> ) in Mid/South Glamorgan and one of only five known in Wales. Old castle cellar is also used by lesser horseshoe bats ( <i>Rhinolophus hipposideros</i> ) as hibernation roost.  | ~4km south of Scheme                                  |

##### NON-STATUTORY SITES

Eighteen non-statutory designates sites were located within 1km of the Scheme area, all of which were Sites of Importance for Nature Conservation (SINCs). Those most relevant within 250m are detailed in Table 2-2.

**Table 3-2 – Non-statutory sites within 250m of the Scheme.**

| Site Name                               | Designation | Description   | Approximate distance and orientation from Scheme (km)                  |
|---|-------------|---|--|
| Mynydd y Grug, West of Cwmfelinfach     | SINC        | Area of sheep-grazed common covered by bracken ( <i>Pteridium aquilinum</i> ), acid grassland and semi-improved acid grassland. Also includes two small marshy areas and three ponds – some of which support Great Crested Newt (GCN) ( <i>Triturus cristatus</i> ). To the north is a quarry containing a pond which also supports GCN. Qualifying features include extensive open countryside with semi-natural upland features, acid grassland, marshy grassland, ponds and GCN. Bracken, quarry and pond habitats are also likely to support amphibians, dragonflies, reptiles and a diverse range of archaeophytes. Bird species recorded include skylark ( <i>Alauda arvensis</i> ), meadow pipit ( <i>Anthus pratensis</i> ), stonechat ( <i>Saxicola rubicola</i> ), wheatear ( <i>Oenanthe oenanthe</i> ), and linnet ( <i>Linaria cannabina</i> ).  | Scheme (Tip 2 and large area to north-west) lay partially within SINC. |
| Mynydd Bach Slopes, East of Llanbradach | SINC        | A west-facing valley side supporting a mix of broadleaved woodland, marshy grassland, semi-improved acid grassland, bracken and scrub. Includes ancient woodland and some wet woodland. Bracken is usually present at the field margins and locally covers large parts of the hillside as a mosaic with acid grassland and scrub. The marshy grassland areas are variable, with some dominated by purple moor-grass ( <i>Molinia caerulea</i> ) and other parts by rushes ( <i>Juncus</i> spp.). The marshy areas generally have a rich wetland flora with good numbers of indicator species. The site is likely to support good number of reptiles, a high diversity of invertebrates, including potentially small pearl-bordered fritillary ( <i>Boloria selene</i> ) butterfly, as well as foraging and roosting habitat for bats. Well-connected woodland and hedges have potential to support dormice ( <i>Muscardinus avellanarius</i> ), and badgers ( <i>Meles meles</i> ) are likely to be present. Bird species recorded include buzzard ( <i>Buteo buteo</i> ), skylark, wheatear, meadow pipit, redstart, and willow warbler ( <i>Phylloscopus trochilus</i> ). | Immediately west of northern sector of Main Site                       |
| Twyn yr Oerfel, South of Cwmfelinfach   | SINC        | North-facing slope making up part of Mynydd y Grug Common. Mainly comprises bracken and acid grassland with scattered scrub. Also includes flush and pond with associated vegetation. Qualifying features include acid grassland, acid flush/marshy grassland and pond with semi-natural vegetation. Pond, acid grassland and bracken are likely to support amphibians, dragonflies and reptiles. Birds recorded include skylark, yellowhammer ( <i>Emberiza citrinella</i> ), meadow pipit, wheatear, stonechat, cuckoo ( <i>Cuculus canorus</i> ), and willow warbler.  | Northern sector of Main Site lay partially within SINC.                |
| Berth Goch Wood, North of Trethomas     | SINC        | Ancient woodland with canopy of mature oak. Heavily sheep and cattle grazed. Dense bluebell carpet in southern part of site. Qualifying features include semi-natural woodland with indicator species, and acid grassland with anthills. Streams are also present, and mature trees are likely to provide foraging and roosting opportunities for bats. Birds recorded include green woodpecker, skylark, meadow pipit, redstart, willow warbler, chiffchaff ( <i>Phylloscopus collybita</i> ), cuckoo, stonechat, blackcap ( <i>Sylvia atricapilla</i> ), and coal tit ( <i>Periparus ater</i> ).  | 45m east (Main Site)   |

| Site Name                                  | Designation | Description   | Approximate distance and orientation from Scheme (km) |
|--|-------------|---|---|
| River Sirhowy                              | SINC        | Comprises full length of River Sirhowy and adjacent semi-natural habitats. River valley is lined by trees along most of its length and flows in natural rocky channel. Japanese knotweed occurs alongside most of river. Qualifying features include watercourse with resident bullhead ( <i>Cottus gobio</i> ) and brown trout ( <i>Salmo trutta</i> ) and migratory anadromous Atlantic salmon ( <i>Salmo salar</i> ) and sea trout ( <i>Salmo trutta</i> ). Otter ( <i>Lutra lutra</i> ) are also likely to be breeding, foraging and resting along the river. This is a relatively unpolluted main river with unmodified bed and banks with adjacent semi-natural wetland, grassland and woodland habitats. Mature trees alongside river likely to be used by roosting bats such as Daubenton's. Birds recorded include dipper, buzzard, cuckoo, pied flycatcher, crossbill ( <i>Loxia curvirostra</i> ), and grey wagtail. | 70m north (Haul Road)                                 |
| Sirhowy Country Park Meadows, Cwmfelinfach | SINC        | Land adjacent to River Sirhowy edge, supporting grassland and scrub habitats. Also contains two ponds. Qualifying features include acid grassland / heath, semi-improved neutral grassland and pond with diverse wetland vegetation. Broadleaved woodland, marshy grassland, bracken and riverbank are also present and habitats on site are likely to support foraging bats, otters, reptiles and a high diversity of invertebrates. Birds recorded include buzzard, mallard ( <i>Anas platyrhynchos</i> ), and grey wagtail.  | 220m north (Haul Road)                                |
| Graig y Prisiad Woodlands, Ynysddu         | SINC        | Comprises mainly replanted, former ancient woodland including indicator species. Bluebell present. Fields along western side include acid grassland, bracken and mature beech ( <i>Fagus sylvatica</i> ). Qualifying features include broadleaved woodland, semi-improved acid grassland, veteran beech trees and grassland with high density of anthills. Woodland, bracken and grassland habitats may support foraging and roosting bats, dormouse, reptiles and fungi. Birds recorded include buzzard, chiffchaff, willow warbler, and redstart.   | 100m north (Haul Road)                                |
| Mynydd Machen, West of RIsca               | SINC        | Area of sheep grazed common, covered mainly by bracken, acid grassland and heath. Calcareous grassland, mature trees and young downy birch scrub woodland also present. Qualifying features include extensive open countryside with semi-natural upland features, acid grassland/heath and calcareous grassland. Grassland, bracken and scrub habitats have potential to support waxcap fungi and reptiles. Birds recorded include buzzard, meadow pipit, raven ( <i>Corvus corax</i> ), stonechat, and linnet.   | 110m south (Haul Road)                                |

## OTHER HABITATS OF CONSERVATION IMPORTANCE

### Ancient Woodland

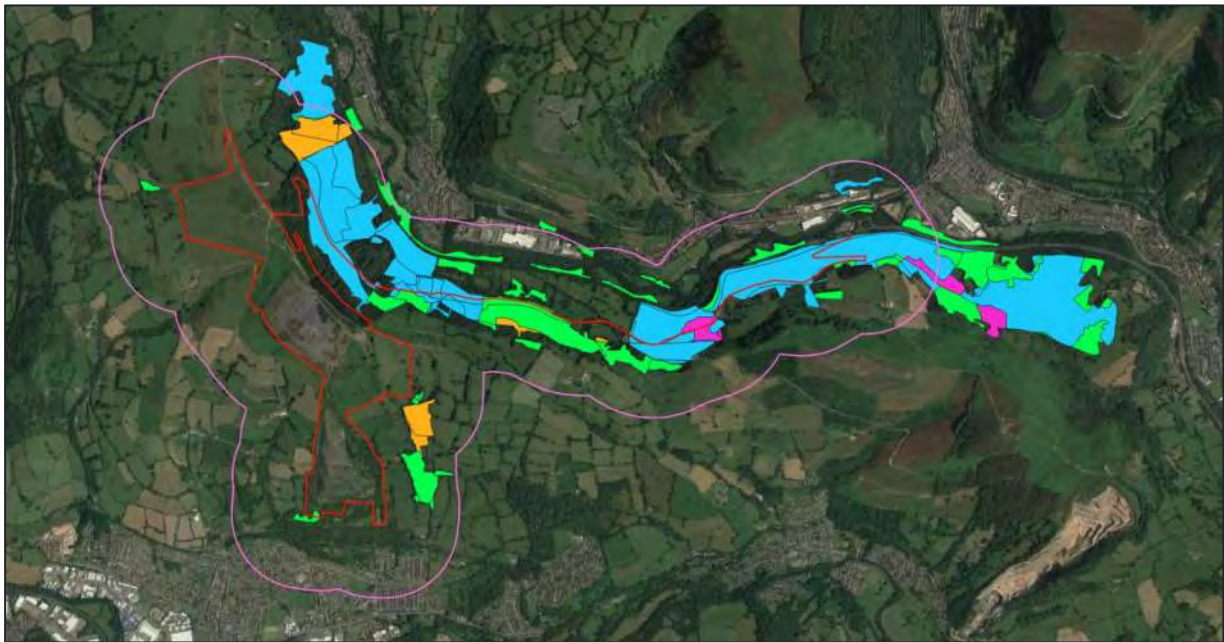
There were 80 Ancient Woodland (AW) sites recorded within 500m of the Scheme, the majority of which were situated in woodland areas surrounding the Haul Road section of the Scheme. The Haul Road itself passed directly through 15 AW sites, including two Ancient Semi-Natural Woodland (ASNW) sites, 12 Plantation on Ancient Woodland (PAW) sites and one Ancient Woodland Site of Unknown Category (AWUC). Additionally, there was one ASNW site situated partly within the



Scheme at the south-western corner of the Main Site. Figure 3-1 shows the locations of AW sites within 500m of the Scheme.

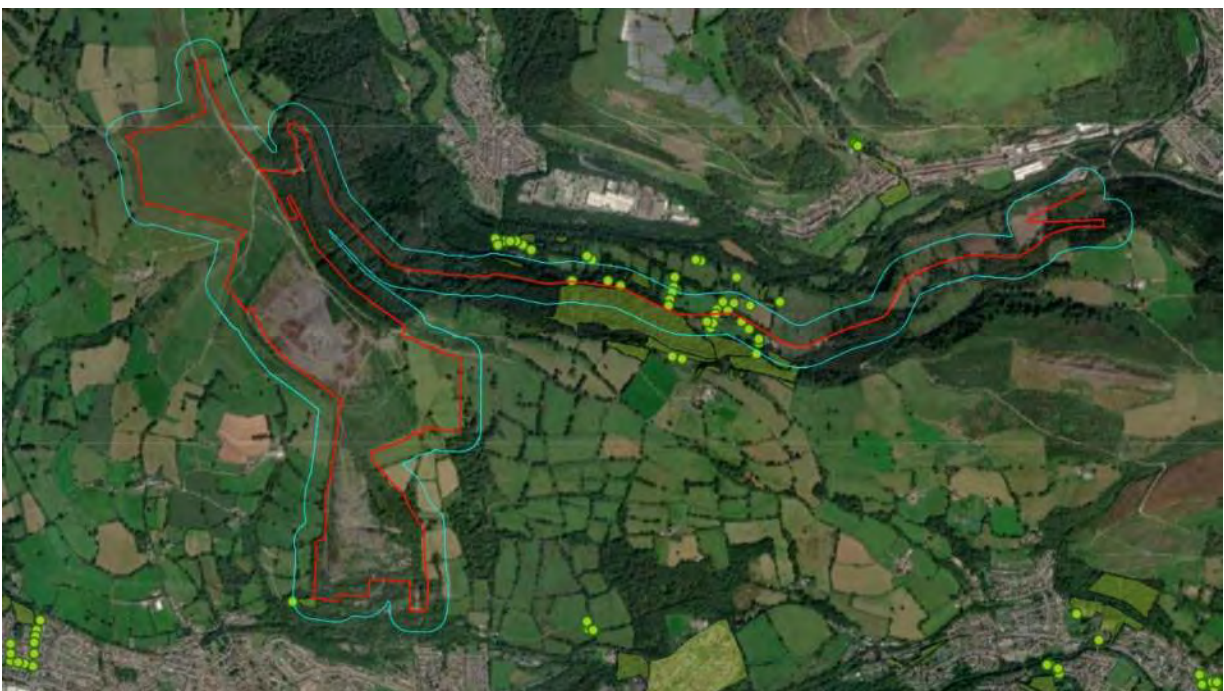
**Figure 3-1 - Ancient Woodland sites within 500m of the Scheme.**

Green polygons indicate Ancient Semi-Natural Woodland, orange polygons indicate Restored Ancient Woodland, blue polygons indicate Plantation on Ancient Woodland, and pink polygons indicate Ancient Woodland Site of Unknown Category. The Scheme is highlighted in red and a 500m buffer is highlighted by a pink line.



**Figure 3-2 - Tree Preservation Orders (TPOs) closest to the Scheme.**

TPOs are indicated by green circles. The Scheme is highlighted in red and the 500m buffer is highlighted by a blue line.



## Tree Preservation Orders

There were at least 40 Tree Preservation Orders (TPOs) located within 100m of the Scheme (see Figure 3-2 for locations), including individual TPO Trees and TPO Groups, Areas, and Woodlands. The majority of these TPOs were located around the Haul Road section of the Scheme, with part of the route running immediately along the edge of a W1 TPO Woodland (3/84/IBC).

## 3.2 PHASE 1 HABITAT SURVEY

### OVERVIEW

A range of habitats and species were found across the survey area. The two tips consisted of extensive areas of coal spoil with varying levels of vegetation, with a general increase in vegetative cover from Tip 2 to Tip 1. Vegetation on the tips consisted mainly of dense scrub and bracken, dry heath, bryophyte/lichen and acid grassland. Habitats surrounding the tips consisted of large areas of bracken, scattered trees, woodland parcels, improved/poor semi-improved grassland fields and some semi-improved grassland fields. Mynydd y Grug common north-west of Tip 2 was dominated by marshy grassland, whilst areas to the south-east included large areas of continuous bracken, alongside scattered trees and various grassland types. The Haul Road mainly consisted of a mixture of coniferous plantation woodland and semi-natural broadleaved woodland, with several areas of felled woodland and some semi-natural mixed woodland.

### PRIORITY HABITATS

The following Priority habitats were identified within the survey area:

- Lowland/ Upland deciduous woodland
- Wet woodland
- Hedgerows
- Lowland dry acid grassland
- Lowland heathland
- Ponds
- Open mosaic habitats on previously developed land

### SEMI-NATURAL WOODLAND

#### Broadleaved

Semi-natural broadleaved woodland (also probable Priority habitat *Lowland/ Upland deciduous woodland*) was present in parcels throughout the Haul Road section of the Scheme, and in areas surrounding Tip 1. Downy birch (*Betula pubescens*) and silver birch (*Betula pendula*) were the most frequently occurring species across the Scheme and were locally abundant in areas. Other woodland species, all occasionally occurring, included ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*) beech (*Fagus sylvatica*), larch (*Larix* sp.), oak (*Quercus* sp.) and willow (*Salix* sp.). Woodlands in the south of the Scheme, particularly those immediately surrounding Tip 1 tended to be immature in comparison with those to the north of the Scheme located along the Haul Road. One area of woodland near the central sector of the Haul Road, consisting mainly of alder and bordering an area of continuous bracken, was identified as Priority habitat *Wet woodland*.

Common ivy (*Hedera helix*) was commonly occurring across woodland parcels. Bracken (*Pteridium aquilinum*) and bramble (*Rubus fruticosus* agg.) were generally frequently occurring, however these species dominated the understorey in some areas, particularly within the more immature woodland



parcels. Other scrub understorey species (listed in descending frequency of occurrence) included hazel (*Corylus avellana*), hawthorn (*Crataegus monogyna*), broom (*Cytisus scoparius*), gorse (*Ulex europaeus*) butterfly-bush (*Buddleja davidii*) and holly (*Ilex aquifolium*). Ground flora included species such as hart's-tongue (*Asplenium scolopendrium*), herb-robert (*Geranium robertianum*), garlic mustard (*Alliaria petiolate*) and wood-sorrel (*Oxalis acetosella*).

Wildlife and Countryside Act (WCA) Schedule 9 invasive non-native species rhododendron (*Rhododendron ponticum*) and Himalayan balsam (*Impatiens glandulifera*) were recorded occurring at rare incidence in semi-natural broadleaved woodland habitats, with the latter being locally abundant in places (see TN5, 8, 10 and 11).

### Figure 3-3 - Semi-natural broadleaved woodland



#### Coniferous

Semi-natural coniferous woodland was recorded in small, linear parcels on and around the edges of Tip 2. These parcels did not have the appearance of being planted and are likely to be self-seeded from nearby areas of coniferous plantation. Species included birch, Douglas fir (*Pseudotsuga menziesii*), larch, Leyland cypress (*Cupressus macrocarpa* x *Xanthocyparis nootkatensis* = *X Cuprocyparis leylandii*) and Scots pine (*Pinus sylvestris*).

#### Mixed

Semi-natural mixed woodland was recorded in a few small fragments along the Haul Road, in addition to one larger area north of Tip 2 and surrounding the western extent of the Haul Road. These were generally immature areas of woodland which are predicted to have self-seeded from nearby areas of semi-natural broadleaved and coniferous plantation woodland. Tree species included birch (commonly occurring), beech, Douglas fir, larch, ash, hawthorn, hazel, holly and oak.

## PLANTATION WOODLAND

#### Coniferous

Coniferous plantation woodland surrounded the Haul Road most significantly at its western extent, with a further small patch occurring at its most easterly extent. A strip of conifer plantation also bordered an area of clearfell at the northern boundary of the Scheme. Species included Douglas fir, larch, Leyland cypress, Norway spruce (*Picea abies*), Sitka spruce (*Picea sitchensis*), Scots pine

and western hemlock-spruce (*Tsuga heterophylla*), with species composition varying between blocks. WCA Schedule 9 invasive non-native species rhododendron was also observed rarely occurring within coniferous plantation.

**Figure 3-4 - Coniferous Plantation Woodland**



**DENSE AND SCATTERED SCRUB**

Fragmented dense and scattered scrub habitats were present throughout the Scheme, with the majority being located on and around Tip 1. Bracken and bramble were the most common scrub species across the survey area, occurring at common incidence overall and abundantly in areas. Gorse was frequently occurring and locally abundant, particularly in association with spoil and heath habitats. Other less frequently occurring species included broom, birch, hawthorn, ash, dog-rose (*Rosa canina*), foxglove (*Digitalis purpurea*) and ferns (*Polypodiophyta* sp.). Scrub habitats often occurred in association with continuous bracken, grassland, woodland, scattered tree and heath habitats. WCA Schedule 9 invasive non-native species wall cotoneaster (*Cotoneaster horizontalis*) was recorded growing on the edge of an area of dense scrub on Tip 1 (TN29), in addition to an unidentified cotoneaster species located further west (TN31).

**Figure 3-5 - Dense and Scattered Scrub**





## SCATTERED TREES

Broadleaved and coniferous scattered trees were recorded throughout the Scheme, often in association with areas of continuous or scattered bracken, various grassland habitats, scrub and heath. The most commonly occurring scattered tree species across the Scheme were birches, whilst hawthorn, hazel, holly and oak species were all frequently occurring. Ash, cherry (*Prunus* sp.), fir (*Pinophyta* sp.), scots pine (*Pinus sylvestris*), beech and European larch (*Larix decidua*) all occurred commonly across the Scheme, whilst the latter two species were locally common and locally frequent, respectively.

**Figure 3-6 - Scattered Mature Beech Trees**



## FELLED WOODLAND

Patches of felled woodland of varying sizes were present along the Haul Road and to the north of Tip 2. The majority of these patches appeared to have been coniferous plantation, however some smaller areas of potentially broadleaved or mixed felled woodland were also identified. WCA Schedule 9 invasive non-native species rhododendron was recorded growing on the edge of an area of felled coniferous woodland (TN2).

## ACID GRASSLAND, DRY DWARF SHRUB HEATH (ACID), LICHEN/BRYOPHYTE HEATH

Acid grassland and dry dwarf shrub heath (acid) habitats were present individually and in mosaic with other habitats throughout the Scheme (classed as Priority Habitat *Open mosaic habitats on previously developed land*).

Areas of unimproved and semi-improved acid grassland without the presence of heath (classed as probable Priority Habitat *Lowland dry acid grassland*) were recorded in small fragments surrounding both tip sites, and around the perimeter of Mynydd y Grug common (generally comprising larger areas). On the spoil tips, acid grassland was often recorded in proximity with habitats such as dry heath, bryophyte heath and gorse scrub, or as a mosaic with these habitats. One area of semi-improved acid grassland (TN14) had a particularly unique topography as several marshy depressions were present in close proximity to each other, containing ephemeral waterbodies and abundant rush species.

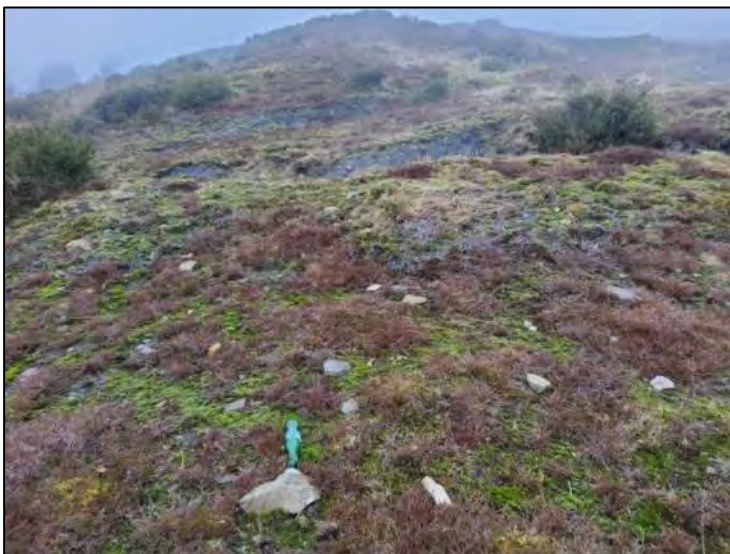
Acid grassland species included grasses such as red fescue (*Festuca rubra*), sheep’s fescue (*Festuca ovina*), common bent (*Agrostis capillaris*) and sweet vernal-grass (*Anthoxanthum odoratum*). Other species included mouse-ear-hawkweed (*Pilosella officinarum*), moss (Bryophyta) species, sheep’s sorrel (*Rumex acetosella*), heath bedstraw (*Galium saxatile*), pill sedge (*Carex pilulifera*), tormentil (*Potentilla erecta*), creeping buttercup (*Ranunculus repens*) and Yorkshire-fog (*Holcus lanatus*).

**Figure 3-7 - Acid Grassland with Strong Bryophyte Layer**



Acid dry dwarf shrub heath (potentially classing as Priority Habitat *Lowland heath*) was present on the slopes of Tip 1 & Tip 2, however there was generally more of this habitat on the Tip 2. This habitat was often growing in mosaic with bryophytes, lichen, acid grassland, scrub and bracken habitats, creating a diverse and heterogenous environment. Heather (*Calluna vulgaris*) and gorse were commonly occurring in these habitats, with broom occurring frequently, and bilberry (*Vaccinium myrtillus*) and mouse-ear hawkweed (*Pilosella officinarum*) occurring occasionally.

**Figure 3-8 – Acid Dry Dwarf Shrub Heath**





The habitats often had strong lichen/bryophyte underlayers, but as vascular plant cover was generally above 30%, these could not be described as lichen/bryophyte heath. There were, however, some small patches of lichen/bryophyte heath recorded on the surface of the spoil on the Tip 1. Areas consisted of *Cladonia* and other lichen species, alongside mosses and occasional mouse-ear-hawkweed.

**Figure 3-9 - Lichen/Bryophyte Heath**



### IMPROVED GRASSLAND

Several improved grassland fields were recorded surrounding the Scheme. One large field to the east of Tip 2 was however wholly contained within the Scheme, as well as the western edges of three fields located to the north of Mynydd y Grug common. Improved grassland fields often showed signs of grazing by sheep and other livestock. Improved grassland habitats were dominated by perennial rye-grass (*Lolium perenne*), with other species such as broad-leaved dock (*Rumex obtusifolius*), common nettle (*Urtica dioica*) and creeping thistle (*Cirsium arvense*) occurring occasionally. Soft-rush (*Juncus effusus*) was occasionally occurring but locally frequent in damp areas.

**Figure 3-10 - Improved Grassland with Poor Semi-improved Grassland in Foreground**





## MARSHY GRASSLAND

Marshy grassland was recorded in one small patch towards the centre of the Haul Road, in several small fragments around and to the south-east of Tip 2, and in a substantial area to the north-west comprising Mynydd y Grug common and surrounding areas. In some areas, such as on Tip 2, marshy grassland existed in mosaic with acid grassland, bryophyte and dry heath. Commonly occurring marshy grassland species across the Scheme included soft-rush and other *Juncus* species. Purple poor-grass (*Molinia caerulea*) was recorded occasionally within marshy grassland habitats, although this species was locally abundant in an area at the north-western boundary of Mynydd y Grug Common.

**Figure 3-11 - Marshy Grassland**



## POOR SEMI-IMPROVED GRASSLAND

Poor semi-improved grassland (PSI) was recorded mainly in clusters to the north-west of Tip 2, and to the east of the tips, south of Twyn yr Oerfel SINC. Smaller, more isolated fragments were recorded towards the centre of the Haul Road and to the north and west of Tip 1. The most common species within PSI habitats were creeping buttercup and ribwort plantain (*Plantago lanceolata*), whilst bent species (*Agrostis*), common sorrel (*Rumex acetosa* subsp. *acetosa*), common nettle, creeping thistle, daisy (*Bellis perennis*), dandelion (*Taraxum officinale* agg.), mouse-ear-hawkweed, Yorkshire-fog and soft-rush were all occasionally occurring.

## CONTINUOUS/SCATTERED BRACKEN

Continuous and scattered bracken was a prominent habitat in the areas surrounding the two tips and also occurred across the Scheme, with further extensive areas located at the eastern extent of the Haul Road. Areas of bracken often co-occurred with other scrub species such as bramble and gorse, and with scattered trees. One particularly extensive area of continuous bracken and scattered broadleaved and coniferous trees was located between and to the east of the two tip sites. On the eastern edge of this habitat parcel (TN16), a small patch of acid grassland was noted as having an abundance of yellow-meadow-ant (*Lasius flavus*) hills, which can be an indicator of increased local biodiversity (King, 2021).

**Figure 3-12 - Continuous Bracken with Scattered Trees and Dry Stone Wall**



### **INUNDATION VEGETATION**

Inundation vegetation was recorded within and around areas of permanent or ephemeral standing and running water (see following section). Rush species most frequently occurred in these habitats, followed by bulrush (*Typha latifolia*), common water starwort (*Callitriche stagnalis*), hemlock water-dropwort (*Oenanthe crocata*), pennywort (*Hydrocotyle* sp.) and opposite-leaved golden-saxifrage (*Chrysosplenium oppositifolium*), all of which were occasionally present across the site.

### **STANDING WATER**

Several ponds (some of which may classify as Priority habitat *Ponds*) were recorded within the Scheme, in addition to numerous ephemeral waterbodies, some of which have been marked by target notes e.g., due to their size, connection to running water or inclusion of inundation vegetation (TN18, 20, 24, 35). The largest pond was located at the south-eastern corner of the Scheme (ST 18107 89454). This pond was surrounded by steep cliffs with exposed rock and was fed by running water forming a waterfall down the cliffside. The pond also fed immediately via a controlled system into a wide, stepped, man-made channel. The pond was enclosed by a tall security fence, appeared to be heavily silted and contained very little vegetation.

**Figure 3-13 - Small Quarry Pond with Controlled Discharge**





Further ponds were recorded at the northern extent of the Scheme (ST 17049 91999), towards the centre of the Haul Road (ST 19538 90735) and to the east of Mynydd y Gryg Common (ST 17401 91332). The latter was a small and likely ephemeral pond, whilst the former two ponds were more established and contained larger amounts of inundation vegetation.

**Figure 3-14 - Pond**



### **RUNNING WATER**

Numerous small streams were recorded flowing from south to north along the Haul Road (see Phase 1 Map and TN1, 3 and 7), most of which were culverted underneath the main track. Some of the smaller streams fed into ditches alongside the track which then joined up to a larger stream to be carried underneath the track. These streams varied in volume and flow rate, ranging from fast flowing and moderate volume to a small trickle. It was considered likely that most, if not all, of these streams eventually fed into the Sirhowy River at the bottom of the hillside.

**Figure 3-15 - Running Water into Ditch and Culvert**



Other areas of running water were recorded at the north, east and south-east of the Scheme, all comprising small streams. A large system of man-made drainage ditches was also recorded on and around both tips, designed to carry excess water from the tips down to the pond at the south-eastern corner of the Scheme area (TN23, 24, 25, 27, 31, 32 and 33). These were mostly dry during the time of the survey.

## SPOIL

Exposed soil was prevalent over both tip sites, with sparse vegetation cover occurring in some areas, and this habitat often formed a mosaic with habitats such as acid grassland, dry heath, lichen/bryophytes and scrub. The area of bare unvegetated spoil was noticeably larger on the Tip 2 than Tip 1.

**Figure 3-16 - Exposed Coal Spoil**



## EPHEMERAL/SHORT PERENNIAL

Ephemeral and short perennial vegetation was observed in disturbed habitats across the Scheme, including species such as creeping buttercup, ribwort plantain, selfheal (*Prunella vulgaris*), weld (*Reseda luteola*), dog-violet (*Viola riviniana*), pearly everlasting (*Anaphalis margaritacea*) and mullein (*Verbascum* sp.).

## HEDGEROWS

One species-poor hedgerow with trees and six intact species-poor hedgerows were recorded within Scheme, all of which were located towards the centre of the Haul Road, within 300m of Ynys Hywel Farm. Hedgerow species included beech, ash, bramble, dogwood, hazel and holly.



**Figure 3-17 - Intact Species-poor Hedgerow**



**BUILDINGS**

A small number of buildings were recorded within the Scheme. These were mainly residential/farm buildings aside from one metal hut situated along the Haul Road at (ST 18480 90950) which was connected to a communications mast.

**Figure 3-18 - Metal Building Connected to Tower**



## BARE GROUND AND HARD STANDING

Bare ground and hard standing was present throughout the Scheme, generally comprising roads, tracks and footpaths.

## WALL

Numerous dry-stone walls were present throughout the Scheme, in varying states of repair and often included areas with piles of stones where collapses had occurred.

**Figure 3-19 – Intact Dry-stone Wall**



## 3.3 PROTECTED AND PRIORITY SPECIES

Species results combining information from data searches and physical observations during the PEA survey are presented as follows. A full list of protected or priority species and species of conservation concern within a 1km radius of the site (5km for bats) is provided in Appendix B.

### EUROPEAN PROTECTED SPECIES

#### Bats

A total of 907 records for bats were returned from 5km data searches. The closest of these was for a common pipistrelle (*Pipistrellus pipistrellus*) recorded approximately 20m north-east of the northern extent of the Haul Road. The closest roost record was for a pipistrelle (species unidentified) maternity roost located on Dyffryn Terrace, approximately 380m north of the Haul Road.

Habitats within the Scheme such as woodland, scrub, mature scattered trees, grassland and standing water were considered suitable for commuting, foraging and roosting bat species.

#### Hazel Dormouse

No records for hazel dormouse (*Muscardinus avellanarius*) were returned from 1km data searches. The Graig y Prisiad Woodlands, Ynysddu SINC, within 100m of the proposed Haul Road, is also cited as containing suitable habitat for dormouse (see Section 3.1).

Habitats within the Scheme such as woodland, scrub and hedgerow were considered suitable to support commuting, foraging, nesting and hibernating hazel dormouse. Areas assessed as most likely to support dormouse presence were woodlands along the Haul Road and at the far south of the Scheme as these were well connected with large expanses of woodland in the wider landscape.



## Otter

One record for otter (*Lutra lutra*) was returned from 1km data searches, comprising a single adult recorded approximately 350m north of the proposed Haul Road, near the Sirhowy River.

Habitats within the Scheme were generally considered sub-optimal for otter. Watercourses were mostly very small and likely to dry out regularly, however it was considered possible for otter to be commuting within the Scheme, particularly along the Haul Road section due to proximity to the Sirhowy River.

## Great Crested Newt

Two records for great crested newt (GCN, *Triturus cristatus*) were returned from 1 km data searches. The closest record was from a previous bottle trapping survey in a pond located approximately 15m west of the north-western corner of the Scheme, which found two male and two female individuals.

From desktop searches, 13 potential ponds were identified within 500m of the Scheme. One pond fell within the red line boundary for the Scheme at the south-east corner of Tip 1, another pond was located within 10m of the north-western corner of the tip.

Standing water habitats within the Scheme, such as the large pond in the north-west sector supporting both submerged and emergent vegetation, were assessed as having potential to support GCN.

## UK PROTECTED SPECIES

### Badger

One record for badger (*Meles meles*) was returned from 1km data searches. This was for indirect evidence for the species in terms of field signs for badger noted on the side of the A468 road, approximately 680m south-east of the south-easternmost point of the Scheme.

Colliery spoil habitats within the Scheme were generally considered unlikely to be suitable for badger sett establishment due to being frequently waterlogged and unstable. However, grassland habitats within the Scheme surrounding the tips were considered suitable for commuting and foraging badger. Woodland habitats, particularly those at the northern edges of the Scheme were also considered to offer some potential to support badger sett establishment. Good connectivity existed to the wider landscape from both the grassland and woodland habitats.

### Other Mammals

Fourteen records for small mammal species were returned from 1km data searches, including two records for brown hare (*Lepus europaeus*), one record for polecat (*Mustela putorius*) and 11 records for West European hedgehog (*Erinaceus europaeus*). The closest of these was for an adult brown hare, observed 5m from the Haul Road.

During the survey rabbits (*Oryctolagus cuniculus*) were noted on Tip 1 and within grassland and scrub edge habitats within the Scheme. Mole (*Talpa europaea*) hills were frequently recorded within grassland habitats and several fox (*Vulpes vulpes*) scats were observed across the Scheme. The non-native invasive species grey squirrel (*Sciurus carolinensis*) was also sighted in woodland habitats.

Evidence of the presence of short-tailed field voles (*Microtus agrestis*), in the form of cached pieces of cut vegetation and piles of small droppings, was located within a patch of marshy grassland adjacent to a wet ditch near a field edge (TN15).

A dead short-tailed field vole was also photographed by WSP Ecologist Technician, Natalie Pyatt, outside of work on the Haul Road on 03 February 2023.

Habitats within the Scheme such as woodland, scrub, grassland, and hedgerows, were considered suitable for commuting, foraging, sheltering, and breeding small mammals, including West European hedgehog.

## **Birds**

A total of 578 records for 27 protected and priority bird species were returned from 1km data searches. These included ten Wildlife and Countryside Act (1981) Schedule 1 (WCA1) bird species and 17 Environment (Wales) Act 2016 Section 7 (S7) species. The closest WCA1 record was for a goshawk (*Accipiter gentilis*), observed directly above Tip 1 within the Scheme. The closest S7 record was for a flock of starling (*Sturnus vulgaris*) recorded within the Scheme at Tip 1.

A total of 27 different bird species were recorded during the PEA survey including the Schedule 1 species red kite (*Milvus milvus*). Winter migrants included the Schedule 1 species fieldfare (*Turdus pilaris*) and redwing (*Turdus iliacus*).

S7 species noted during the surveys included dunnock (*Prunella modularis*), kestrel (*Falco tinnunculus*), linnet (*Linaria cannabina*), song thrush (*Turdus philomelos*), starling and skylark (*Alauda arvensis*). A full list of species recorded during the survey is recorded in Appendix E.

Habitats throughout the Scheme such as the woodland, scrub, scattered trees, grassland, bracken, and hedgerows were considered suitable to support breeding, nesting, and commuting bird species. Habitats within the Scheme were also likely to provide feeding and shelter throughout the year.

On the border between an area of felled woodland and an area of semi-natural broadleaved woodland, a standing coniferous tree was recorded with substantial amounts of avian faecal matter on the trunk, indicating potential raptor activity (TN6). A possible raptor nest was also observed higher up in the tree within the branches.

## **Reptiles**

A total of eight records for three reptile species were returned from 1km data searches. This included three records for common lizard (*Zootoca vivipara*), one for adder (*Vipera berus*) and four for slow-worm (*Anguis fragilis*). The closest of these was for a common lizard found during removal of a stone wall, within the Scheme on the north-eastern boundary of Mynydd y Grug common.

The mosaic of habitats within the Scheme including south-facing banks, areas of bare ground, dwarf shrub, dry heath, grassland, scrub, bracken, stone walls and rocky areas were considered to provide excellent conditions for reptiles to forage, shelter and bask. Dense vegetation, bracken and leaf litter, disused mammal burrows such as those made by rabbits, as well as brash piles present within the Scheme were also considered to offer abundant reptile refugia.

## **Amphibians (excluding GCN)**

A total of seven records for two amphibian species were returned from 1km data searches. This included four records for common frog (*Rana temporaria*) and three for palmate newt (*Lissotriton*

*helveticus*). The closest of these was for a palmate newt, recorded during a torchlight survey of a pond approximately 15m from the northern extent of the Scheme.

Aquatic habitats within the Scheme such as permanent and ephemeral ponds and wet ditches such as those located alongside the Haul Road and at field margins were considered suitable to support amphibians during their aquatic life stage.

Habitats such as woodland, grassland, and scrub were also considered suitable to support commuting, foraging, sheltering, and hibernating amphibians during their terrestrial life stages.

### **Invertebrates**

A total of 66 records for 17 protected and priority invertebrate species were returned from 1km data searches. This included records for Red Data Book species dingy skipper (*Erynnis tages*) and small heath (*Coenonympha chenopodiata*). Small heath and dingy skipper were both recorded within the Scheme on Tip 1.

The mosaic of habitats within the Scheme including exposed areas of colliery spoil, bare ground, dwarf shrub, dry heath, scrub, bracken, dead wood, woodland, and grassland were considered suitable to support a wide and diverse range of terrestrial invertebrates.

Fresh water habitats on site such as ponds, wet ditches, and ephemeral water bodies were considered suitable to support aquatic life stages of a number of invertebrates such as dragonflies and damselflies.

### **Notable Flora**

Four records for bluebell (*Hyacinthoides non-scripta*) were returned from 1km data searches. The closest of these records was located approximately 250m south of the Haul Road, within Graig Goch woodland.

There were no protected/priority plant species visible within the Scheme at the time of the PEA survey with most plant species not being easily visible during winter when the survey was conducted.

In subsequent months, however, whilst conducting other species-specific surveys for the Scheme, bluebells were recorded growing within woodland areas. A particularly large quantity of bluebells was recorded within woodland east of the eastern extent of the Haul Road. No further protected/priority plant species were recorded within the Scheme.

### **INVASIVE NON-NATIVE PLANT SPECIES**

A total of 38 records for 16 invasive non-native plant species were returned from 1km data searches, including seven Wildlife and Countryside Act (1981) Schedule 9 (WCA9) species. WCA9 species included Himalayan balsam (*Impatiens glandulifera*), Japanese knotweed (*Fallopia japonica*), Japanese rose (*Rosa rugosa*) variegated yellow archangel (*Lamium galeobdolon* subsp. *argentatum*), montbretia (*Crocsmia pottsii x aurea* = *C. x crocosmiiflora*), Virginia-creeper (*Parthenocissus quinquefolia*) and wall cotoneaster (*Cotoneaster horizontalis*). The closest WCA9 record was for Himalayan balsam, recorded approximately 140m north-east of the eastern extent of the Haul Road, in close proximity to the Sirhowy River.

Schedule 9 non-native invasive species recorded during the survey included rhododendron (*Rhododendron ponticum*) (TN2, TN5, TN10 & TN11), Himalayan balsam (TN8), and wall cotoneaster (TN29).

The non-native species Himalayan honeysuckle (*Leycesteria formosa*) was also recorded growing alongside the Haul Road (TN4).


### 3.4 PRELIMINARY ROOST ASSESSMENTS FOR BATS (EXTERNAL)

An exhaustive search for potential roost features within trees was not carried out during the PEA predominantly due to the size of the Scheme and the high number of trees present.

A specific Ground Level Tree Assessment (GLTA) survey will be undertaken to identify other trees with potential roost features within the Scheme and a separate report will be issued.

As such Table 2-3 provides only an example of a tree with potential roost features suitable to support roosting bats.

**Table 3-3 – Potential roosting feature identified.**

| TN/ Feature | Grid reference | Description   | Photograph   |
|-------------|----------------|---|--|
| TN26        | ST1789889937   | Potential roost feature:<br>Exposed heart-rot cavity from base of unknown depth<br><br>Diameter at breast height approximately 1.3m |  |

## 4 DISCUSSION AND RECOMMENDATIONS

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### 4.1 STATUTORY DESIGNATED SITES

Two statutory designated sites were located within 1km of the Scheme, including two LNR sites. The Haul Road was either immediately adjacent to or passed directly through the Graig Coch LNR over approximately 530m of its length. Flatwood Meadow LNR was located approximately 170m from the Haul Road.

**Potential impacts include:**

- Direct loss of LNR habitat if widening of track to create Haul Road is necessary;
- Pollution and short-term disturbance to relevant species during construction, impact depending on nature of works;
- Potential major pollution event from spillage of fuel/hailed materials;
- Increased air pollution from vehicular traffic during operational phase; and
- Increased disturbance to relevant species during operational phase.

Mitigation measures for statutory designated sites are listed in Section 3.7.

### 4.2 NON-STATUTORY DESIGNATED SITES

Two Sites for the Importance of Nature Conservation (SINCs) were located partly within the Scheme. A large area of the Scheme located north-west of the Tip 2 site overlapped with a considerable part of the Mynydd y Grug SINC (approximately 40ha). Immediately bordering this area to the north-west lies Mynydd Bach Slopes SINC. Twyn yr Oerfel SINC overlaps with the Scheme by a considerably smaller amount (0.5 ha) and is located to the east of Tip 2.

**Potential impacts include:**

- Direct (partial) loss through excavation e.g., for creation of pumping station/pond, drainage channels, coal stockyard (Mynydd y Grug);
- Loss/damage/degradation of habitat through deposition of materials i.e., spoil/subsoil (Mynydd y Grug & Twyn yr Oerfel);
- Modification through tree planting (Mynydd y Grug); and
- Air/water pollution (all surrounding sites).

Mitigation measures for non-statutory designated sites are listed in Section 3.7.

### 4.3 ANCIENT WOODLAND AND TPOS

The proposed Haul Road passes directly through several Ancient Woodland (AW) sites, including two Ancient Semi-Natural Woodland (ASNW) sites. A further ASNW site is also partly within the Scheme at the south-western corner of the Main Site. Many other AW sites are also intersected by or in close proximity to the Scheme. ASNW is considered an irreplaceable biodiversity and landscape resource, and all efforts should be made to retain it (Welsh Government, 2021).

**Potential impacts include:**

- Direct (partial) loss of AW if widening of track to create Haul Road is necessary; and
- Pollution through air or water, resulting in degradation.



Numerous TPOs are located in close proximity to the Scheme, particularly surrounding the Haul Road. At this stage it is not known which/if any trees protected under TPOs will need to be removed or will be at risk of damage from the Scheme as the exact nature of works has not yet been decided. The following works to trees protected by TPOs are not permitted unless CCBC provide written consent:

- Cutting down;
- Topping;
- Lopping/pruning;
- Uprooting; and
- Cutting the roots.

If any TPOs within the Scheme are impacted by the proposed works in any of the ways listed above, consent will need to be given from CCBC prior to any works commencing on the protected trees. There may also be conditions attached to any consent given, such as re-planting.

## 4.4 PRIORITY HABITATS

Seven Priority habitats were identified within the survey area, including: *lowland mixed deciduous/Uplandwoodland; wet woodland; hedgerows; lowland dry acid grassland; lowland heathland; ponds; and open mosaic habitats on previously developed land*. All of these habitats except for *wet woodland* and *hedgerow* were located within the Scheme, and therefore have the potential to be impacted by direct loss, damage and degradation through the variety of works occurring across the site. Those located outside of the Scheme also have the potential to be affected by pollution.

Priority habitats are of principal importance for the purpose of maintaining and enhancing biodiversity in Wales as listed under Section 7 of the Environment (Wales) Act 2016. This places a duty on Welsh Ministers to “take all reasonable steps to maintain and enhance the types of habitat included in any list published under this section and, encourage others to take such steps”.

## 4.5 PROTECTED AND PRIORITY SPECIES

### BATS

There is potential for bats to be commuting, foraging and roosting in habitats across the Scheme. There is therefore potential for bats to be impacted through habitat loss, roost disturbance/ destruction and general disruption of activities such as commuting and foraging.

All species of bats are European Protected Species protected under various legislation (see Appendix A) including the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, and it is an offence to deliberately disturb, damage and/or destroy a breeding or resting site of a bat.

Further detailed bat assessments are provided in separate reports (WSP, 2023 and WSP, 2023a).

### HAZEL DORMOUSE

There is potential for dormouse to be commuting, foraging, nesting and hibernating in habitats within Scheme, particularly within woodland parcels surrounding the Haul Road and to the south of the Scheme. There is therefore potential for dormouse to be killed or injured by works, and for nesting/foraging habitat to be lost or degraded.



Dormice are European Protected Species, and they and their habitats are strictly protected by a range of legislation and policy, including Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019; the Wildlife and Countryside Act 1981, as amended; and Environment (Wales) Act 2016. This legislation makes it an offence to deliberately capture, injure or kill dormouse, to deliberately disturb dormouse and to damage or destroy a dormouse breeding site or resting place.

A separate dormouse survey report for the Scheme has been produced (WSP, 2023b).

## **OTTER**

Habitats within the Scheme were considered sub-optimal for otter due to the small size and likely ephemeral quality of most watercourses which are unlikely to provide food resources or regularly used commuting routes. It was considered however, possible that otter may still be commuting within the area. The habitats considered most likely to be utilised by otter were those in proximity to the Sirhowy River. As the Haul Road within the Scheme was located closest to the Sirhowy River, works in association with this section were considered most likely to have potential impacts on otter. Such impacts could include injury or death by operational machinery or vehicles, and noise/light disturbance.

Otter is a European Protected Species, protected by a range of legislation including the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Under this legislation, it is an offence to deliberately capture, injure or kill an otter, to deliberately disturb an otter, and to damage or destroy a breeding site or resting place of an otter.

The implementation of general otter mitigation measures, listed in Section 3.8, should be followed to minimise the risk of impacts on any otter that may be present within the Scheme.

## **GREAT CRESTED NEWT**

There is potential for GCN to be present within standing water bodies and terrestrial habitats within the Scheme and/or within 500m of the Scheme boundary. If GCN are present within the Scheme or within ponds within 500m, there is potential for them to be impacted by works through death, injury, habitat loss and fragmentation.

GCN are a European Protected Species, and their breeding/resting sites are strictly protected by a range of legislation, including the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019; the Wildlife and Countryside Act (WCA) 1981, as amended; and Environment (Wales) Act 2016. This legislation provides protection against killing, injury, disturbance, capture, taking and sale, and their breeding sites, resting places, and places used for shelter are also fully protected.

A separate great crested newt survey report for the Scheme has been produced (WSP, 2023c).

## **BADGER**

There is potential for badger to be commuting and foraging in grassland habitats within the Scheme, with some potential for sett establishment within woodland habitats. There is therefore potential for badger to be disturbed by works and for foraging habitat to be lost.

Badgers are protected under various legislation including the Protection of Badgers Act 1992 and Schedule 5 WCA, which makes it an offence to deliberately injure or kill a badger. It is also an offence to interfere with a badger sett by damaging, destroying, or obstructing it.



A separate badger survey report has been produced for the Scheme (WSP, 2023d).

## **BIRDS**

There is potential for birds, including protected and priority species, to be present and breeding within a variety of habitats across the Scheme. There is therefore potential for breeding birds to be disturbed by works, and for protected/priority bird species to be disturbed and for habitat loss to occur.

Birds are protected under the Wildlife and Countryside Act 1981 (as amended) and it is an offence to damage or destroy a bird's nest whilst it is in use, or to kill or injure a bird, or to destroy an egg. Further protections are afforded to species listed on Schedule 1 of the Wildlife and Countryside Act 1981, as amended.

A separate ground-nesting and raptor survey report has been produced for the Scheme (WSP, 2023e)

## **WEST EUROPEAN HEDGEHOG AND OTHER SMALL MAMMALS**

West European hedgehog and other small mammals are likely to be present within vegetation such as scrub, brash and log piles, hedgerow, and woodland within the Scheme. These animals are therefore at risk of being killed or injured by heavy machinery moving around the site, by excavation and during vegetation removal.

Under the Wild Mammals (Protection) Act 1996, all wild mammals are protected against crushing and asphyxiation. Implementation of measures detailed in Section 3.8 should be followed to mitigate against potential impacts to mammals from the Scheme.

## **REPTILES**

Reptiles have been recorded within and in close proximity to the Scheme. Considering the high levels of suitability for reptiles to be commuting, foraging, basking and sheltering within a variety of habitats across the survey area, it is assumed that reptiles will be present within the Scheme. There is therefore potential for reptiles to be killed, injured or disturbed by works, and for reptile habitat to be lost.

Common reptiles are protected against intentional killing and injury under the Wildlife and Countryside Act (WCA) 1981 (as amended).

Implementation of measures detailed in Section 4.8 should be followed to mitigate against potential impacts to reptiles from the Scheme.

## **AMPHIBIANS**

There is potential for amphibians (other than GCN) to be present within aquatic and terrestrial habitats within the Scheme.

Common toad is listed under Section 7 of the Environment (Wales) Act 2016 as a species of principal importance for conserving biodiversity in Wales.

General reptile/amphibian/small mammal mitigation measures listed in Section 4.7 should be followed to reduce impacts to amphibians as a result of the Scheme.

## INVERTEBRATES

The diverse mosaic of habitats found within the Scheme are likely to support a wide range of invertebrate species. As the survey was conducted in winter, most invertebrate species were not likely to be active/visible during the time of the survey.

A separate terrestrial invertebrates survey report has been produced for the Scheme (WSP, 2023f)

Further survey of invertebrates will be ongoing during 2023 to determine the likely impacts of the Scheme on invertebrates and develop appropriate mitigation and/or enhancement measures.

## NOTABLE FLORA

The Priority and protected plant species, bluebell, was recorded in woodland areas within the survey area during other ecological surveys undertaken for the Scheme.

It is therefore possible that the protected and priority plant species, bluebell, could be impacted by vegetation clearance to facilitate the proposed works.

Bluebells are protected under the wildlife and Countryside Act 1981 (as amended). It is illegal to uproot the plant or bulb without permission from the landowner.

## INVASIVE NON-NATIVE PLANT SPECIES

Rhododendron, Himalayan balsam and wall cotoneaster were recorded within the Scheme. These were all recorded either within the Main Site or on the edge of the Haul Road and therefore have the potential to be spread by the proposed works.

Under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), it is an offence to “plant or otherwise cause” the species listed above to grow in the wild. A suitable method statement (detailed in Section 3.8) will therefore be required to negate the risk of spreading any invasive species present within the Scheme.

## 4.6 FURTHER ASSESSMENT/SURVEY

The following assessments and/or surveys were carried out and reported on separately for the Scheme during 2023:

- Bat static detectors survey (WSP, 2023a);
- Ground Level Tree Assessment (GLTA) for bats (WSP, 2023a);
- Dormouse survey (WSP, 2023b);
- Great crested newt survey (WSP, 2023c);
- Badger survey (WSP, 2023d);
- Ground-nesting bird and raptor surveys (WSP, 2023e); and
- Terrestrial invertebrates survey (WSP, 2023f).

## 4.7 PRELIMINARY AVOIDANCE, MITIGATION AND COMPENSATION MEASURES

The following preliminary avoidance, mitigation and compensation measures should be incorporated into the proposed works to ensure compliance with relevant wildlife legislation. Further measures may also be required and will be provided in separate survey reports.





## **ECOLOGICAL METHOD STATEMENT/CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)**

An Ecological Method Statement (EcMS) and Construction Environmental Management Plan (CEMP) should be in place to cover mitigation aspects across designated sites, TPOs, and protected/priority habitats and species. This should cover aspects such as pollution prevention, habitat management, species-specific mitigation, topsoil re-use, turf translocation and tree management.

### **GRAIG GOCH LNR**

The Haul Road passes directly through Graig Goch LNR and as such measures will need to be taken to ensure the designated site is not adversely impacted directly or indirectly by construction works. Strict mitigation and pollution prevention measures should be followed and included in a Construction Environmental Management Plan (CEMP).

### **SINC CONSULTATION AND PROTECTION**

Consultation will be required with the CCBC county ecologist regarding the loss of habitat (if required) within the Mynydd y Grug and Twyn yr Oerfel SINC areas. Unavoidable loss will need to be kept to a minimum and failing this, enhancements to the remaining SINC areas will need to be made. Any capacity to implement longer term management should also be considered.

The following SINC areas will all require protection throughout the duration of the proposed works: Mynydd y Grug; Twyn yr Oerfel; Mynydd Bach Slopes; Berth Goch Wood; Graig y Prisiad Woodlands; River Sirhowy; Sirhowy Country Park Meadows and Mynydd Machen.

Strict pollution prevention measures should be implemented throughout works to protect nearby SINC areas. These measures should be included in a CEMP.

### **PRIORITY HABITAT, AW AND TPO**

Priority habitats, ancient woodland and trees/woodland protected by TPOs should be avoided. Protection of retained priority/AW/TPO habitats by erection of fencing/taping off should also be implemented to ensure vehicles and personnel do not track through these and cause unnecessary damage.

Where avoidance is not possible, works should be planned to ensure damage or removal is minimised through use of smaller machinery/reduced construction areas where possible. Where habitat removal is unavoidable the works should be designed to ensure these are replaced or reinstated on a like for like basis where possible, using existing seedbank (topsoil re-use) and/or re-planting (2:1 for woodland areas) post-works to ensure habitat connectivity is maintained.

Strict pollution prevention measures should be followed throughout the duration of works to ensure any retained priority habitat/AW/TPOs are not damaged/degraded by pollution from works.

## GENERAL BAT/OTTER/BADGER MITIGATION

The following measures are recommended to reduce disturbance of bats/otter/badger utilising the wider area for foraging or commuting purposes:

| Mitigation Measure                  | Description  |
|-------------------------------------|--|
| Avoidance of night working          | If the proposed works are carried out during the time of year when bats are active (i.e., April to September inclusive), works should be carried out during daylight hours; commencing at least one hour following sunrise and finishing at least one hour before sunset, to avoid unnecessary disturbance to bats. Avoidance of night-time working will also reduce disturbance to badger and otter.<br><br>If night-time working is unavoidable, then advice on how to reduce potential disturbance to bats/badger/otter should be sought from a suitably qualified ecologist. |
| Maintenance of wildlife corridors   | An open flight path should always be available during the works to allow commuting and foraging bats to move freely.   |
| Construction lighting               | If additional/temporary lighting is required for safety, any light sources used should be directional and positioned to prevent excessive light spill from the immediate works area.   |
| Materials and Machinery             | Materials and machinery should be locked away in the site compound when not in use, day, night or weekend. Where this is not possible, they will need to be fenced off.  |
| Excavations                         | Any excavations should be securely fenced off and covered over at the end of the working period, at weekends or when not in use.   |
| Discovery of bat roost/ badger sett | If a bat roost or badger sett is unexpectedly discovered during works, all works within the area must cease (within 30 m for badger sett) and advice must be obtained from a licenced ecologist or Natural Resources Wales.  |

## REPTILE/AMPHIBIAN/SMALL MAMMAL METHOD STATEMENT

An appropriate method statement for reptiles, amphibians, and small mammals will be required for any clearance and excavations of hedgerow, scrub or woodland. The method statement should outline a precautionary two-stage cutting process, appropriate timings of works and ecological supervision requirements.

Furthermore, to limit the potential for mammals (burrowing or otherwise) to be accidentally crushed or asphyxiated during any excavation works required, the following measures should be implemented:

- Areas of tall grass, log/brush piles and scrub should be checked prior to clearance for species such as hedgehog; and
- Rabbit burrows should be temporarily fenced off and the entrances soft stopped with grass overnight. These will be checked by an ecologist the following morning to ascertain whether they are in use prior to destruction. If the burrow is in use, it should be dug out with hand tools or a mini digger under ecological supervision to ensure no animals are harmed.

Recommendations regarding working method statements for European protected species are made in separate species reports.

## NOTABLE FLORA

If bluebells are found to be present in areas where soil excavation is required e.g., widening of the Haul Road, the topsoil containing the bulbs (if uncontaminated by non-native invasive Schedule 9 species) should be translocated and placed in areas unaffected by the works. This should be done under the guidance of an ecologist to ensure that no other existing priority species are adversely impacted and that soil levels are not raised above tree root collars leading to the death of some trees.

## INVASIVE SPECIES METHOD STATEMENT

The appointed contractor will be required to provide an appropriate invasive species method statement for the proposed development. This should be in place and followed for the duration of any construction works to minimise the risk of spreading any Schedule 9 plant species.

## TOOLBOX TALK

An experienced ecologist will be required to provide a toolbox talk to all contractors/site staff and advise them of all the ecological constraints on site and mitigation required before any works begin. Ecological constraints are to be determined in full following surveys recommended in Section 3.6.

## POLLUTION PREVENTION MEASURES

Standard best practice and pollution control measures should be implemented for the duration of works in accordance with relevant guidance (e.g., CIRIA (2001) and NetRegs (2018) Guidance for Pollution Prevention (GPP)) to ensure that ecological features within and in proximity to the Scheme are not adversely affected by dust, uncontrolled surface water run-off, inappropriate storage of materials and inappropriate refuelling of machinery. Full details of measures to be followed should be included in a CEMP.

## 4.8 ECOLOGICAL ENHANCEMENT OPPORTUNITIES

The following enhancement measures are recommended to comply with The Environment (Wales) Act 2016 and Planning Policy Wales (11th Ed. 2021):

### Creation of additional wildlife ponds

Creation of additional wildlife ponds would be beneficial for species such as amphibians, grass snake (*Natrix helvetica helvetica*), bats, birds, mammals, and a range of invertebrates.

### Cattle/sheep proof fencing

Fencing off existing ponds where not directly affected by the works e.g., the pond within Mynydd y Grug SINC at the northern extent of the Scheme and/or additional wildlife ponds to prevent cattle/sheep poaching the ground and allow more species-rich marginal vegetation to develop. This would also enhance the water quality within the pond thereby improving habitat conditions for a range of species.

Provision would however need to be made for cattle/sheep on Mynydd y Grug to have access to other water bodies for drinking.

### **Supplementary seeding and plug planting**

Set aside designated strips/patches of native, locally sourced wildflower seeds or plug plants of species representative of the area to improve habitat. These may need to be fenced off to prevent cattle/sheep poaching the ground for seeds/plants to thrive. Species such as common bird's-foot-trefoil (*Lotus corniculatus*). would provide additional habitat for dingy skipper (*Erynnis tages*) (confirmed present on site) as well as providing a food source for bees.

### **Replanting**

Where woodland habitat removal is unavoidable and re-planting is required, consideration should be given to using locally sourced native species of value to dormouse e.g., hazel, hawthorn, and honeysuckle (*Lonicera periclymenum*).

### **Brash piles**

Creation of brash/log piles from vegetation clearance to facilitate the works. Ideally, brash piles should be placed in a sunny position to create additional habitat for species such as reptiles, amphibians, small mammals, and invertebrates.

### **Bat boxes**

Three summer roost bat boxes to be installed in suitable habitat within the Scheme under the guidance of an ecologist to enhance roosting potential for bats within the Scheme. Recommended make and model: Treble or Double Crevice; NHBS reference #187784/ #187782; available at: <https://www.nhbs.com/improved-crevice-bat-box>

### **Installation of small bird species nest boxes**

A range of bird boxes should be installed in suitable habitat within the Scheme under the guidance of an ecologist to enhance nesting potential for small birds. These should include open-fronted boxes and boxes with holes of 25, 30 and 32mm diameter.

### **Installation of kestrel boxes**

Kestrel, a rapidly declining species in the UK, was recorded hunting within the Scheme near Tip 2. Provision of a nest box suitable for kestrel should be made within the Scheme boundary under the guidance of a suitably qualified ecologist.

Schwegler boxes, or similar type, are recommended for durability. An example of suitable boxes can be found at <https://www.nhbs.com>

[Note: The recommendations made within this report should be considered alongside recommendations for faunal species and habitats in other species-specific reports in respect to these works.](#)

## 5 CONCLUSION

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The Scheme area was considered to have high ecological value. Graig Goch LNR, Mynydd y Grug SINC and Twyn yr Oerfel SINC, AWs, TPOs and seven Priority/ probable Priority habitat types lie within/partially within the Scheme area.

Habitats within the Scheme and surrounding area were considered suitable to support bats, dormouse, otter, great crested newt, badger, breeding birds, and a range of terrestrial invertebrates. Small mammals, reptiles, amphibians and protected Priority plant species, bluebell, were all confirmed present..

The recommendations provided in Section 4.7 should be read and followed in conjunction with those recommendations stated in other species-specific reports for the Scheme to ensure that the works at Bedwas Tips adhere to best practice guidelines and are compliant with current wildlife legislation.



## 6 REFERENCES

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- Caerphilly County Borough Council (CCBC) (2022). Tree Preservation Orders in CCBC. Available at: <https://www.arcgis.com/apps/webappviewer/index.html?id=8fbe45e163664775819414bd3b5029c4> [Accessed December 2022]
- CIEEM (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.
- Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.
- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.
- Environment (Wales) Act 2016
- Google Earth (2023).
- Joint Nature Conservation Committee (JNCC) (2010). Handbook for Phase 1 habitat survey. A technique for environmental audit. Joint Nature Conservation Committee, Peterborough, England.
- King, T. J, (2021). Ant-hill heterogeneity and grassland management. Ecol Solut Evidence. 2:e12037. Available at <https://doi.org/10.1002/2688-8319.12037>.
- Multi-Agency Geographic Information System (MAGIC, 2022).
- Natural Resources Wales (NRW) <https://datamap.gov.wales/> - Ancient Woodland Inventory [Accessed November 2022]
- South East Wales Biodiversity Records Centre (SEWBReC) (2022). Biodiversity Information Search –Bedwas Tips [Ref: 7000956].
- Stace, C. A., (2010). (3rd Edition) New Flora of the British Isles, Cambridge University Press
- Welsh Government (2021). Planning Policy Wales. Edition 11. [Online]. [Accessed November 2022]. Available at: <http://www.gov.uk>
- Wildlife and Countryside Act (1981) (as amended).
- WSP (2023) Bedwas Tips Bat Static Surveys – Technical Note
- WSP (2023a) Bedwas Tips Ground Level Tree Assessment report
- WSP (2023b) Bedwas Tips Reclamation Dormouse Survey Report
- WSP (2023c) Bedwas Tips Reclamation Great Crested Newt Survey Report
- WSP (2023d) Bedwas Tips Reclamation Badger Survey Report
- WSP (2023e) Bedwas Tips Reclamation Ground-nesting Bird and Raptor Surveys Report
- WSP (2023f) Bedwas Tips Reclamation Terrestrial Invertebrates Survey Report



## **DRAWINGS**

GC4277-WSP-74-XX-M2-L-0001 – Designated Sites

GC4277-WSP-74-XX-M2-L-3010 (Sheet 1 of 2) - Phase 1 Habitat Map – Main Site

GC4277-WSP-74-XX-M2-L-3011 (Sheet 2 of 2) – Phase 1 Map – Haul Road



# Key

— Scheme Boundary

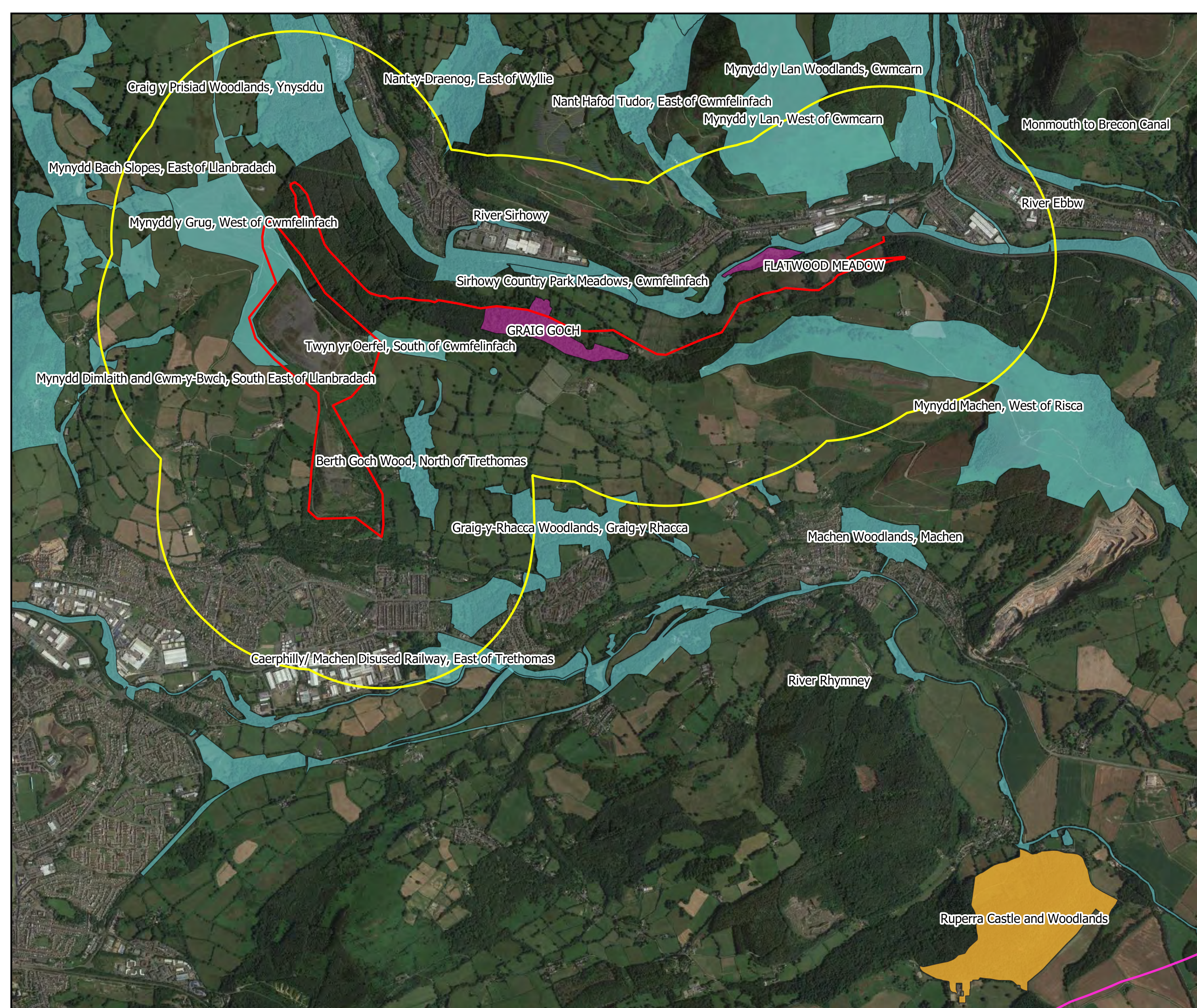
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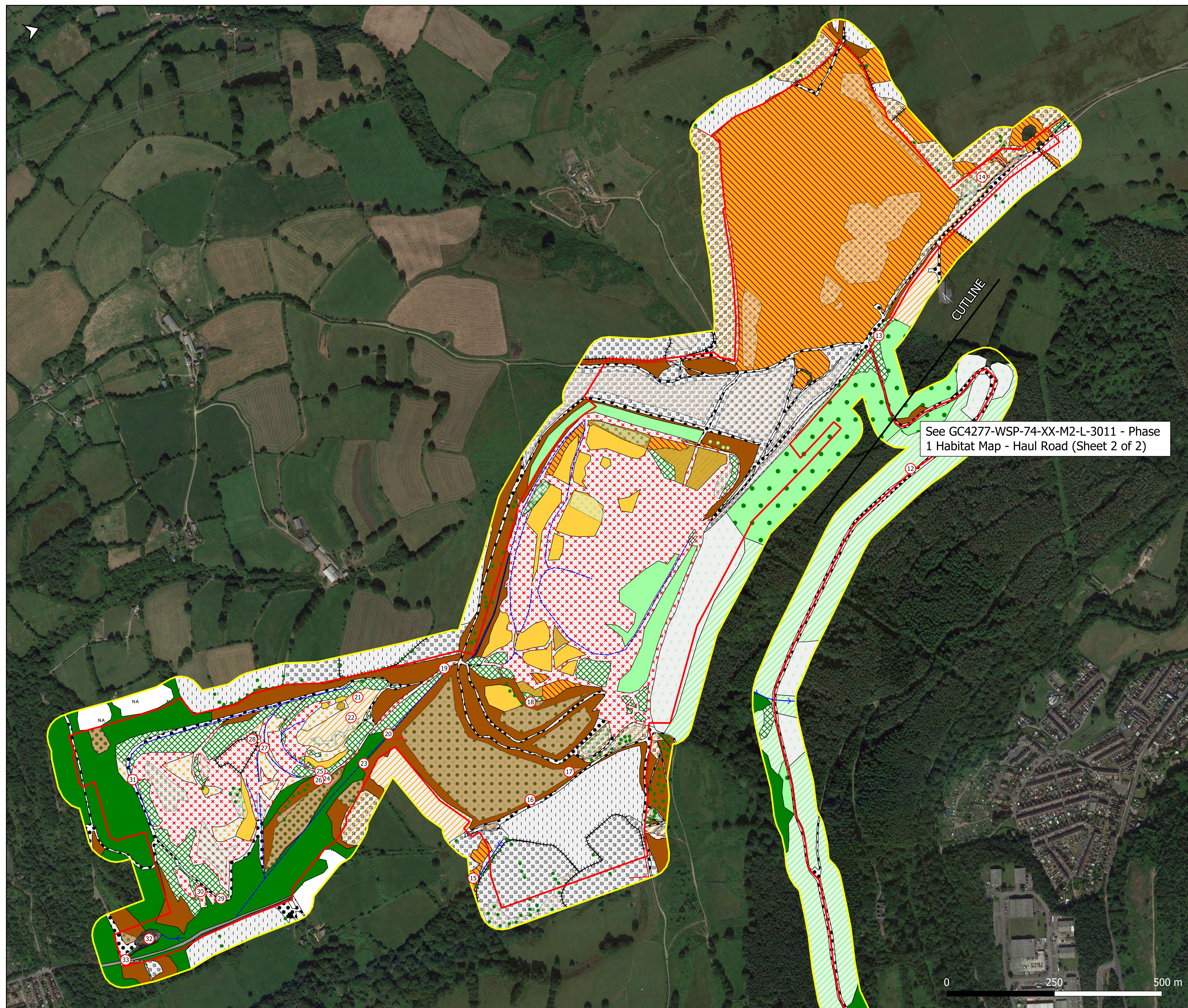
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SINC



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| Rev   | Drwn     | Chk'd    | Appr'd        | Description  | Date     |
| Purpose of issue  |          |          |               |              |          |
| S2 - Suitable for Information   |          |          |               |              |          |
| Classification  |          |          |               |              |          |
| Confidential  |          |          |               |              |          |
| Client  |          |          |               |              |          |
| Energy Recovery Investments Ltd   |          |          |               |              |          |
| Project   |          |          |               |              |          |
| Bedwas Tips Reclamation   |          |          |               |              |          |
| Drawing Title   |          |          |               |              |          |
| Designated Sites  |          |          |               |              |          |
| Drawn   | Checked  |          | Approved      |              |          |
| CGR   | CGR      |          | GP            |              |          |
| Project No  | Date     | Scale    | Size          |              |          |
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| Drawing identifier  |          |          | Revision: P01 |              |          |
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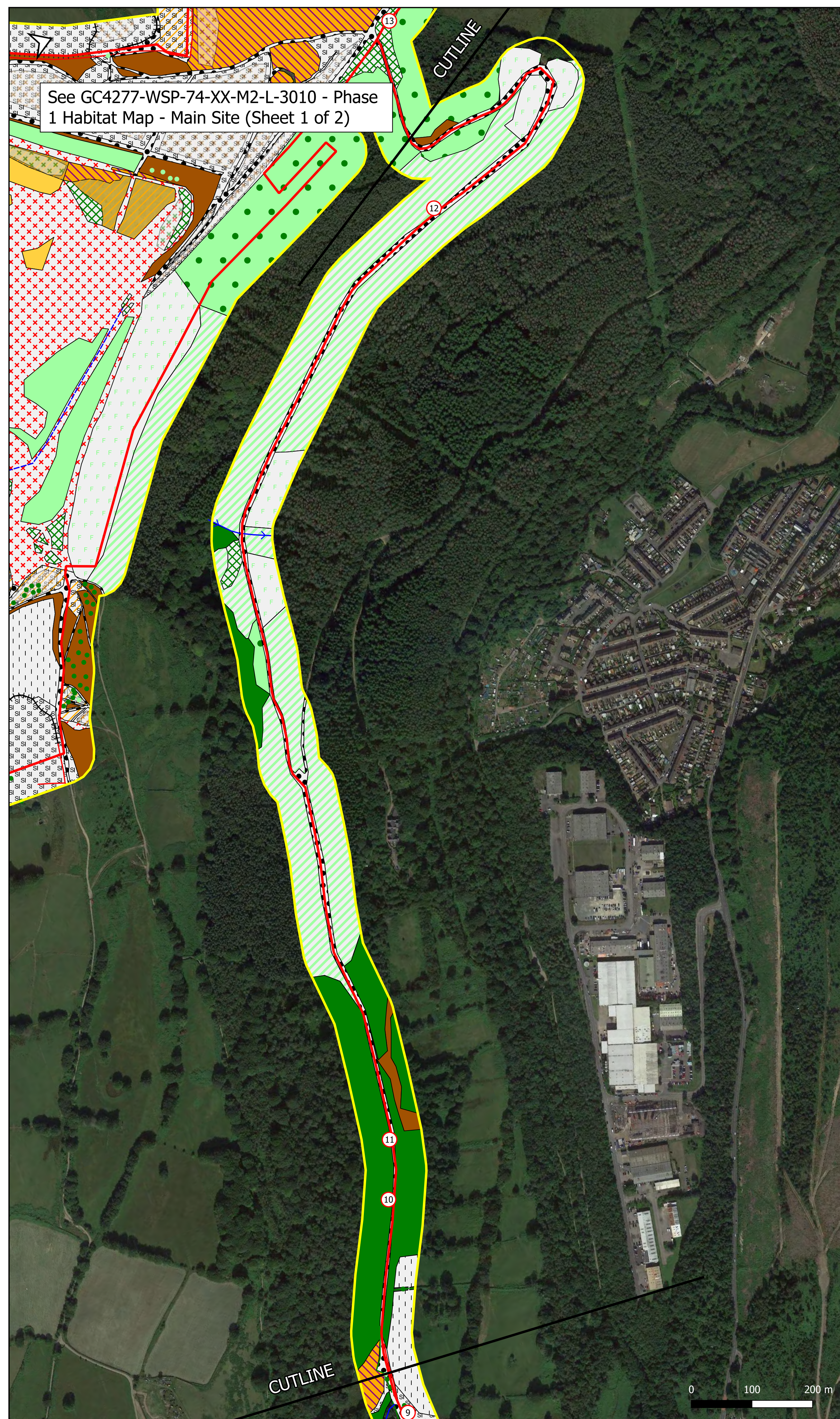


- Key:**
- Redline Boundary
  - 50m Survey Boundary
  - Broadleaved
  - Coniferous
  - Running Water
  - Intact hedge - species-poor
  - + + + + Hedge with trees - species-poor
  - Fence
  - Wall
  - Dry Ditch
  - Scrub - scattered
  - Broadleaved Parkland/scattered trees
  - Coniferous Parkland/scattered trees
  - Mixed Parkland/scattered trees
  - Bracken - scattered
  - Broadleaved woodland - semi-natural
  - Coniferous woodland - semi-natural
  - Coniferous woodland - plantation
  - Mixed woodland - semi-natural
  - Scrub - dense/continuous
  - Coniferous woodland - recently felled
  - Acid grassland - unimproved
  - Acid grassland - semi-improved
  - Neutral grassland - semi-improved
  - Improved grassland
  - Marsh/marshy grassland
  - Poor semi-improved grassland
  - Bracken - continuous
  - Dry dwarf shrub heath - acid
  - Lichen/bryophyte heath
  - Dry heath/acid grassland
  - Spoil
  - Buildings
  - Bare ground
  - Hardstanding
  - Not Accessed
  - Target Notes

See GC4277-WSP-74-XX-M2-L-3011 - Phase 1 Habitat Map - Haul Road (Sheet 2 of 2)

|  |               |         |        |               |            |
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| P01  | NP            | TO      | GP     | First Issue.  | 19/12/2023 |
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| <b>Energy Recovery Investments</b>   |               |         |        |               |            |
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| <b>Bedwas Tip</b>  |               |         |        |               |            |
| Drawing Title  |               |         |        |               |            |
| <b>Phase 1 Habitat Map - Main Site (Sheet 1 of 2)</b>                            |               |         |        |               |            |
| Drawn  | NP            | Checked | TO     | Approved      | GP         |
| Project No   | Date          | Scale   | Size   |               |            |
| GC/004277  | November 2023 | 1:4,000 | A1     |               |            |
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| <b>GC4277-WSP-74-XX-M2-L-3010</b>  |               |         |        |               |            |
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| Quest House, St Mellons Business Park, Fortran Rd, St. Mellons, Cardiff, CF3 0EY |               |         |        |               |            |





**Key:**

- Redline Boundary
- 50m Survey Boundary
- Broadleaved scattered trees
- Coniferous scattered trees
- Running Water
- Intact hedge - species-poor
- + + + + Hedge with trees - species-poor
- + + + + Fence
- Wall
- - - - Dry Ditch
- x x x x Scrub - scattered
- o o o o Broadleaved Parkland/scattered trees
- / / / / Coniferous Parkland/scattered trees
- . . . . Mixed Parkland/scattered trees
- x x Bracken - scattered
- Broadleaved woodland - semi-natural
- Coniferous woodland - semi-natural
- Coniferous woodland - plantation
- Mixed woodland - semi-natural
- Scrub - dense/continuous
- Coniferous woodland - recently felled
- Acid grassland - unimproved
- Acid grassland - semi-improved
- Neutral grassland - semi-improved
- Improved grassland
- Marsh/marshy grassland
- Poor semi-improved grassland
- Bracken - continuous
- Dry dwarf shrub heath - acid
- Lichen/bryophyte heath
- Dry heath/acid grassland
- Spoil
- Buildings
- Bare ground
- Hardstanding
- Not Accessed
- Target Notes

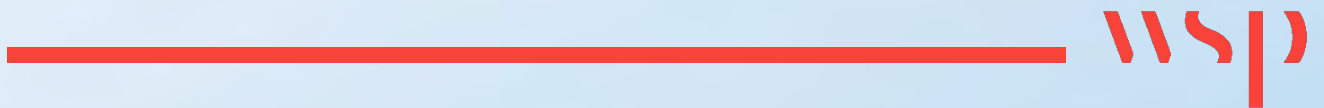
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| <b>Energy Recovery Investments</b>                    |               |         |        |               |            |
| Project   |               |         |        |               |            |
| <b>Bedwas Tip</b>                                     |               |         |        |               |            |
| Drawing Title   |               |         |        |               |            |
| <b>Phase 1 Habitat Map - Haul Road (Sheet 2 of 2)</b> |               |         |        |               |            |
| Drawn   | NP            | Checked | TO     | Approved      | GP         |
| Project No  | Date          | Scale   | Size   |               |            |
| GC/004277   | November 2023 | 1:4,000 | A1     |               |            |
| Drawing identifier                                    |               |         |        | Revision: P01 |            |
| <b>GC4277-WSP-74-XX-M2-L-3011</b>                     |               |         |        |               |            |

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# Appendix A

## RELEVANT LEGISLATION AND PLANNING POLICY





## EUROPEAN PROTECTED SPECIES

European Protected Species are those species listed on Schedule 2 of The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The list includes all species of bats, dormouse, great crested newt and otter. The species listed on Schedule 2 are afforded protection against:

- deliberate capture, injury or killing;
- deliberate disturbance;
- deliberate taking or destruction of the eggs; and
- damage or destruction of a breeding site or resting place of such an animal.

Where a European protected species is present, a development may only proceed, under a licence issued by the relevant governing body i.e. Natural Resources Wales.

## BIRDS DIRECTIVE (DIRECTIVE 2009/147/EC)

Annex 1 of the Birds Directive lists species and sub-species which are:

- in danger of extinction;
- vulnerable to specific changes in their habitat;
- considered rare because of small populations or restricted local distribution;
- requiring particular attention for reasons of the specific nature of habitat.

For these species Member States must conserve their most suitable territories in number and size as Special Protection Areas (SPAs). Species listed on Annex 1 of the Birds Directive include kingfisher and red kite.

## WILDLIFE AND COUNTRYSIDE ACT 1981 (AS AMENDED)

### SCHEDULE 1

All naturally occurring British bird species are protected under the Wildlife and Countryside Act 1981 (as amended). The legislation protects all birds, their nests and eggs and it is an offence to:

- intentionally kill, injure and take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; or
- intentionally take or destroy the egg of any wild bird.

Birds listed on Schedule 1 of the above legislation (e.g. kingfisher and red kite) are afforded further protection and it is an offence to:

- intentionally or recklessly disturb the bird while nest building or while at (or near) a nest with eggs or young; or
- disturb the dependent young of such a bird.

### SCHEDULE 5

Section 9 of the Wildlife and Countryside Act 1981 (as amended) offers varying degrees of protection to species including otter, bats, dormice, amphibians and reptiles. Animals listed on Schedule 5 of the Act are protected against one or more of the following:

- intentional killing, injuring or taking (not applicable to bats);





- intentional or reckless damage or destruction, or obstruction of access to any structure or place which any wild animal included in Schedule 5 uses for shelter or protection;
- disturbance of any such animal while it is occupying a structure or place which it uses for that purpose;
- sell, offer or exposes for sale, or has in his possession or transports for the purpose of sale, any live or dead wild animal included in schedule 5, or any part of, or anything derived from such an animal.

## **SCHEDULE 8**

Plant species listed on Schedule 8 are protected under Section 13 of the Wildlife and Countryside Act 1981 (as amended). Section 13 protects plants from:

- intentional picking, uprooting or destruction;
- selling, offering for sale, possessing or transporting for the purpose of sale (live or dead, part or derivative);
- advertising (any of these) for buying or selling.

## **SCHEDULE 9**

Section 14 of the Wildlife and Countryside Act 1981 (as amended) makes it an offence to “plant or otherwise cause to grow in the wild any plant which is included in Part II of Schedule 9”.

## **WILD MAMMALS (PROTECTION) ACT 1996**

Provides protection for wild mammals against certain acts of deliberate harm including crushing and asphyxiation.

Wild mammal means any mammal which is not a ‘protected animal’ within the meaning of the Animal Welfare Act 2006 (Schedule 3, Section 13). Hedgehog would be included under this definition.

## **ENVIRONMENT (WALES) ACT 2016**

Section 7 of the Environment (Wales) Act has replaced the Section 42 of the NERC Act 2006 in Wales. Section 7 lists the living organisms and types of habitat in Wales which are considered to be of key significance to sustain and improve biodiversity in relation to Wales.

The Act states that Welsh Ministers must take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section and encourage others to take such steps.

## **UK BAP**

UK BAP priority species are those that have been identified as being the most threatened and requiring conservation action. This includes (but is not limited to) species such as common toad, otter, great crested newt, slow worm, common lizard, brown long-eared bat, noctule and soprano pipistrelle.

## **RED AND AMBER LISTS**

Red-listed bird species are those which:

- Are globally threatened;



- Have suffered a historical population decline in the UK during 1800–1995;
- Have suffered a severe (at least 50%) decline in the UK breeding population over the last 25 years, or longer-term period (the entire period used for assessments since the first review, starting in 1969);
- Have suffered a severe (at least 50%) contraction of the UK breeding range over the last 25 years, or the longer-term period;

Amber-listed bird species are those which:

- Have unfavourable conservation status in Europe (SPEC = Species of European Conservation Concern)
- Have suffered a historical population decline during 1800–1995, but recovering; population size has more than doubled over last 25 years
- Have suffered a moderate (25-49%) decline in the UK breeding population over the last 25 years, or the longer-term period
- Have suffered a moderate (25-49%) contraction of the UK breeding range over last 25 years, or the longer-term period
- Have suffered a moderate (25-49%) decline in the UK non-breeding population over last 25 years, or the longer-term period
- Are rare breeders; 1–300 breeding pairs in UK
- Are rare non-breeders; less than 900 individuals
- Are localised; at least 50% of the UK breeding or non-breeding population in 10 or fewer sites, but not applied to rare breeders or non-breeders
- Are internationally important; at least 20% of European breeding or non-breeding population in UK (NW European and East Atlantic Flyway populations used for non-breeding wildfowl and waders respectively).

## **NATIONALLY SCARCE**

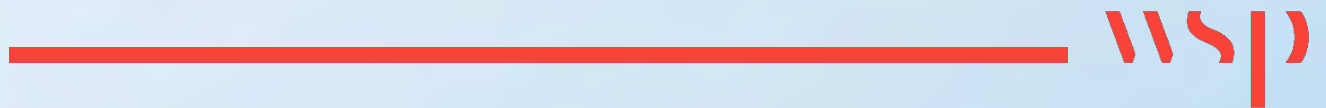
These are species occurring in 16-100 hectares in Great Britain.

## **INVASIVE NON-NATIVE SPECIES**

Any non-native animal or plant that has the ability to spread causing damage to the environment, the economy, our health and the way we live

# Appendix B

## SUMMARY OF ECOLOGICAL DESK STUDY DATA





## Bat species records within 5 km of the Scheme.

| Bats Within 5 km           |                                   |  |                   |                    |
|----------------------------|-----------------------------------|--|-------------------|--------------------|
| Common Name                | Scientific Name                   | Legislation / Conservation Status                | Number of Records | Most Recent Record |
| Bat (unidentified species) | <i>Chiroptera</i>                 | EPS, WCA5  | 74                | August 2022        |
| Brandt's bat               | <i>Myotis brandtii</i>            | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 6                 | September 2021     |
| Brown Long-eared Bat       | <i>Plecotus auritus</i>           | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 64                | September 2021     |
| Common pipistrelle         | <i>Pipistrellus pipistrellus</i>  | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 216               | September 2022     |
| Daubenton's bat            | <i>Myotis daubentonii</i>         | EPS, HDir, WCA5, Bern, RDB2 (UK), LBAP (CLY)     | 87                | September 2021     |
| Greater horseshoe bat      | <i>Rhinolophus ferrumequinum</i>  | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 46                | July 2021          |
| Lesser horseshoe bat       | <i>Rhinolophus hipposideros</i>   | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 12                | October 2021       |
| Lesser noctule             | <i>Nyctalus leisleri</i>          | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 7                 | August 2021        |
| Long-eared Bat species     | <i>Plecotus</i>                   | EPS, HDir, WCA5, Bern                            | 9                 | July 2021          |
| Myotis Bat species         | <i>Myotis</i>                     | EPS, HDir, WCA5, Bern                            | 17                | May 2020           |
| Nathusius's pipistrelle    | <i>Pipistrellus nathusii</i>      | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 39                | September 2021     |
| Natterer's bat             | <i>Myotis nattereri</i>           | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 3                 | September 2021     |
| Noctule bat                | <i>Nyctalus noctula</i>           | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 89                | September 2021     |
| Pipistrelle Bat species    | <i>Pipistrellus</i>               | EPS, WCA5  | 54                | March 2022         |
| Serotine                   | <i>Eptesicus serotinus</i>        | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 16                | September 2021     |
| Soprano pipistrelle        | <i>Pipistrellus pygmaeus</i>      | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 120               | September 2021     |
| Whiskered bat              | <i>Myotis mystacinus</i>          | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 39                | September 2021     |
| Whiskered/Brandt's bat     | <i>Myotis mystacinus/brandtii</i> | EPS, HDir, WCA5, Bern, LBAP (CLY)                | 9                 | June 2016          |

## Protected and priority species records within 1 km of the Scheme.

| Protected and Priority Species within 1 km (Excluding bats) |                                 |  |                   |                    |
|---|---------------------------------|--|-------------------|--------------------|
| Common Name   | Scientific Name                 | Legislation / Conservation Status                        | Number of Records | Most Recent Record |
| <b>Mammals</b>  |                                 |  |                   |                    |
| Brown hare  | <i>Lepus europaeus</i>          | S7, LBAP (CLY)   | 2                 | July 2022          |
| Eurasian badger   | <i>Meles meles</i>              | BA, Bern, LBAP (CLY)                                     | 1                 | June 2021          |
| Eurasian otter  | <i>Lutra lutra</i>              | EPS, HDir, WCA5, S7, Bern, CITES, RDB2 (UK), LBAP (CLY)  | 1                 | March 2021         |
| Polecat   | <i>Mustela putorius</i>         | HDir, S7, Bern, RDB2 (UK)                                | 1                 | March 2019         |
| West European hedgehog                                      | <i>Erinaceus europaeus</i>      | S7, Bern   | 11                | March 2021         |
| <b>Birds</b>  |                                 |  |                   |                    |
| Brambling   | <i>Fringilla montifringilla</i> | WCA1.1, WBAm(RSPB)                                       | 1                 | December 2018      |
| Bullfinch   | <i>Pyrrhula pyrrhula</i>        | S7, WBR(RSPB), LBAP (CLY), UKBAm(RSPB)                   | 12                | June 2020          |
| Crossbill   | <i>Loxia curvirostra</i>        | WCA1.1, Bern   | 2                 | January 2020       |
| Cuckoo  | <i>Cuculus canorus</i>          | S7, WBR(RSPB), UKBR(RSPB)                                | 10                | April 2021         |
| Dunnock   | <i>Prunella modularis</i>       | S7, Bern, UKBAm(RSPB)                                    | 100               | June 2021          |
| Fieldfare   | <i>Turdus pilaris</i>           | BDir22, WCA1.1, WBAm(RSPB), UKBR(RSPB)                   | 2                 | February 2021      |
| Firecrest   | <i>Regulus ignicapilla</i>      | WCA1.1, Bern, WBAm(RSPB)                                 | 1                 | September 2015     |
| Goshawk   | <i>Accipiter gentilis</i>       | WCA1.1, WCA9, CITES, LBAP (CLY)                          | 5                 | October 2021       |
| Herring gull  | <i>Larus argentatus</i>         | BDir22, S7, WBR(RSPB), UKBR(RSPB)                        | 40                | November 2020      |
| Hobby   | <i>Falco subbuteo</i>           | WCA1.1, Bern, CITES                                      | 2                 | July 2016          |
| House sparrow   | <i>Passer domesticus</i>        | S7, WBAm(RSPB), UKBR(RSPB)                               | 212               | June 2021          |
| Kestrel   | <i>Falco tinnunculus</i>        | S7, Bern, CITES, WBR(RSPB), UKBAm(RSPB)                  | 5                 | September 2021     |
| Kingfisher  | <i>Alcedo atthis</i>            | BDir1, WCA1.1, Bern, LBAP (CLY), WBAm(RSPB), UKBAm(RSPB) | 13                | November 2020      |
| Lesser redpoll  | <i>Acanthis cabaret</i>         | S7, LBAP (CON), WBAm(RSPB), UKBR(RSPB)                   | 11                | November 2020      |
| Linnet  | <i>Linaria cannabina</i>        | S7, Bern, WBR(RSPB), UKBR(RSPB)                          | 5                 | September 2021     |
| Nightjar  | <i>Caprimulgus europaeus</i>    | BDir1, S7, Bern, LBAP (CLY), WBAm(RSPB), UKBAm(RSPB)     | 4                 | June 2017          |
| Peregrine   | <i>Falco peregrinus</i>         | BDir1, WCA1.1, Bern, CITES, LBAP (CLY),                  | 6                 | August 2021        |

|                                |                                |  |    |                |
|--------------------------------|--------------------------------|--|----|----------------|
| Pied flycatcher                | <i>Ficedula hypoleuca</i>      | S7, WBR(RSPB), UKBR(RSPB)                            | 1  | June 2018      |
| Red kite                       | <i>Milvus milvus</i>           | BDir1, WCA1.1, WCA9, CITES, WBAm(RSPB)               | 12 | November 2021  |
| Redwing                        | <i>Turdus iliacus</i>          | BDir22, WCA1.1, WBAm(RSPB), UKBR(RSPB)               | 46 | November 2021  |
| Reed bunting                   | <i>Emberiza schoeniclus</i>    | S7, Bern, LBAP (CLY), WBAm(RSPB), UKBAm(RSPB)        | 4  | March 2016     |
| Skylark                        | <i>Alauda arvensis</i>         | BDir22, S7, LBAP (CLY), WBAm(RSPB), UKBR(RSPB)       | 4  | September 2021 |
| Song thrush                    | <i>Turdus philomelos</i>       | BDir22, S7, Bern, LBAP (CLY), WBAm(RSPB), UKBR(RSPB) | 48 | July 2021      |
| Spotted flycatcher             | <i>Muscicapa striata</i>       | S7, Bern, WBR(RSPB), LBAP (CLY), UKBR(RSPB)          | 2  | September 2020 |
| Starling                       | <i>Sturnus vulgaris</i>        | BDir22, S7, Bern, WBR(RSPB), UKBR(RSPB)              | 24 | September 2021 |
| Tree pipit                     | <i>Anthus trivialis</i>        | S7, Bern, WBAm(RSPB), UKBR(RSPB)                     | 4  | April 2021     |
| Wood warbler                   | <i>Phylloscopus sibilatrix</i> | S7, WBR(RSPB), UKBR(RSPB)                            | 2  | June 2018      |
| <b>Reptiles and Amphibians</b> |                                |  |    |                |
| Adder                          | <i>Vipera berus</i>            | WCA5, S7, Bern, LBAP (CLY)                           | 1  | July 2013      |
| Common frog                    | <i>Rana temporaria</i>         | HDir, WCA5, Bern, LBAP (CLY)                         | 4  | June 2021      |
| Common lizard                  | <i>Zootoca vivipara</i>        | WCA5, S7, Bern, LBAP (CLY)                           | 3  | April 2018     |
| Great crested newt             | <i>Triturus cristatus</i>      | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY)     | 2  | June 2015      |
| Palmate newt                   | <i>Lissotriton helveticus</i>  | WCA5, Bern, LBAP (CLY), LI(BIS)                      | 3  | June 2022      |
| Slow-worm                      | <i>Anguis fragilis</i>         | WCA5, S7, Bern, LBAP (CLY)                           | 4  | August 2021    |
| <b>Invertebrates</b>           |                                |  |    |                |
| Autumnal rustic                | <i>Eugnorisma glareosa</i>     | S7   | 2  | September 2013 |
| Brindled beauty                | <i>Lycia hirtaria</i>          | S7   | 1  | May 2021       |
| Broom moth                     | <i>Ceramica pisi</i>           | S7   | 1  | July 2022      |
| Buff ermine                    | <i>Spilosoma lutea</i>         | S7   | 2  | July 2013      |
| Cinnabar                       | <i>Tyria jacobaeae</i>         | S7   | 5  | June 2021      |
| Dark-barred twin-spot carpet   | <i>Xanthorhoe ferrugata</i>    | S7   | 2  | August 2013    |
| Dingy skipper                  | <i>Erynnis tages</i>           | S7, RDB1 (UK) - VU, LI(SEWBRc)                       | 7  | May 2020       |
| Dot moth                       | <i>Melanchra persicariae</i>   | S7   | 3  | July 2022      |
| Feathered gothic               | <i>Tholera decimalis</i>       | S7   | 3  | August 2013    |
| Flounced chestnut              | <i>Anchoscelis helvola</i>     | S7   | 3  | September 2013 |



|                  |                                  |                    |    |                |
|------------------|----------------------------------|--------------------|----|----------------|
| Forester         | <i>Adscita staitices</i>         | S7, LI(BIS)        | 9  | June 2014      |
| Knot grass       | <i>Acronicta rumicis</i>         | S7                 | 2  | July 2022      |
| Sallow           | <i>Cirrhia icteritia</i>         | S7                 | 3  | September 2013 |
| Shaded broad-bar | <i>Scotopteryx chenopodiata</i>  | S7                 | 2  | July 2016      |
| Small heath      | <i>Coenonympha pamphilus</i>     | S7, RDB1 (UK) - NT | 10 | August 2020    |
| Small phoenix    | <i>Ecliptopera silaceata</i>     | S7                 | 9  | July 2022      |
| White ermine     | <i>Spilosoma lubricipeda</i>     | S7                 | 2  | June 2022      |
| <b>Plants</b>    |                                  |                    |    |                |
| Bluebell         | <i>Hyacinthoides non-scripta</i> | WCA8, LBAP (CLY)   | 4  | March 2021     |





## Species of Conservation Concern within 1 km of the Scheme.

| Species of Conservation Concern within 1 km |                                |   |                |                    |
|---|--------------------------------|---|----------------|--------------------|
| Common Name                                 | Scientific Name                | Legislation / Conservation Status         | No. of Records | Most Recent Record |
| <b>Birds</b>                                |                                |   |                |                    |
| Common gull                                 | <i>Larus canus</i>             | BDir22, WBR(RSPB), UKBAm(RSPB)            | 1              | January 2014       |
| Common sandpiper                            | <i>Actitis hypoleucos</i>      | WBR(RSPB), UKBAm(RSPB)                    | 1              | June 2018          |
| Cormorant                                   | <i>Phalacrocorax carbo</i>     | WBAm(RSPB)                                | 2              | November 2019      |
| Dipper                                      | <i>Cinclus cinclus</i>         | Bern, LBAP (CLY), WBAm(RSPB), UKBAm(RSPB) | 21             | April 2021         |
| Goldcrest                                   | <i>Regulus regulus</i>         | Bern, WBAm(RSPB)                          | 22             | November 2020      |
| Great Black-backed Gull                     | <i>Larus marinus</i>           | BDir22, WBR(RSPB), UKBAm(RSPB)            | 2              | August 2015        |
| Green woodpecker                            | <i>Picus viridis</i>           | Bern, LBAP (CLY), WBAm(RSPB)              | 9              | March 2016         |
| Greenfinch                                  | <i>Chloris chloris</i>         | Bern, WBAm(RSPB)                          | 11             | May 2021           |
| Grey heron                                  | <i>Ardea cinerea</i>           | WBAm(RSPB)                                | 11             | October 2021       |
| Grey wagtail                                | <i>Motacilla cinerea</i>       | Bern, LBAP (CLY), WBAm(RSPB), UKBR(RSPB)  | 24             | March 2021         |
| Lesser Black-backed Gull                    | <i>Larus fuscus</i>            | BDir22, WBAm(RSPB), UKBAm(RSPB)           | 81             | July 2019          |
| Long-tailed Tit                             | <i>Aegithalos caudatus</i>     | WBAm(RSPB)                                | 37             | April 2021         |
| Mallard                                     | <i>Anas platyrhynchos</i>      | BDir21, WBAm(RSPB), UKBAm(RSPB)           | 19             | April 2021         |
| Meadow pipit                                | <i>Anthus pratensis</i>        | Bern, WBAm(RSPB), UKBAm(RSPB)             | 7              | September 2021     |
| Mistle thrush                               | <i>Turdus viscivorus</i>       | BDir22, Bern, WBAm(RSPB), UKBR(RSPB)      | 12             | June 2021          |
| Redstart                                    | <i>Phoenicurus phoenicurus</i> | Bern, WBAm(RSPB), UKBAm(RSPB)             | 13             | May 2020           |
| Shoveler                                    | <i>Spatula clypeata</i>        | BDir21, CITES, WBAm(RSPB), UKBAm(RSPB)    | 3              | July 2021          |
| Snipe                                       | <i>Gallinago gallinago</i>     | BDir21, WBAm(RSPB), UKBAm(RSPB)           | 1              | November 2018      |
| Swallow                                     | <i>Hirundo rustica</i>         | Bern, WBAm(RSPB)                          | 5              | September 2021     |
| Swift                                       | <i>Apus apus</i>               | WBAm(RSPB), UKBAm(RSPB)                   | 51             | September 2021     |
| Wheatear                                    | <i>Oenanthe oenanthe</i>       | Bern, WBAm(RSPB)                          | 28             | May 2021           |
| Whitethroat                                 | <i>Curruca communis</i>        | WBR(RSPB)                                 | 4              | April 2020         |



|                |                               |                               |    |            |
|----------------|-------------------------------|-------------------------------|----|------------|
| Willow warbler | <i>Phylloscopus trochilus</i> | WBR(RSPB), UKBAm(RSPB)        | 8  | June 2018  |
| Woodcock       | <i>Scolopax rusticola</i>     | BDir21, WBR(RSPB), UKBR(RSPB) | 28 | April 2021 |
| <b>Plants</b>  |                               |                               |    |            |
| Fritillary     | <i>Fritillaria meleagris</i>  | RDB2 (UK) - S                 | 1  | April 2022 |



## Invasive non-native species within xx km of the Scheme

| Invasive species within 1 km                           |  |                                   |                   |                    |
|--|--|-----------------------------------|-------------------|--------------------|
| Common Name  | Scientific Name  | Legislation / Conservation Status | Number of Records | Most Recent Record |
| <b>Mammals</b>   |  |                                   |                   |                    |
| Eastern grey squirrel                                  | <i>Sciurus carolinensis</i>  | WCA9, INNS                        | 2                 | 2021               |
| <b>Birds</b>   |  |                                   |                   |                    |
| Canada goose   | <i>Branta canadensis</i>   | BDir21, WCA9, INNS                | 5                 | August 2015        |
| <b>Invertebrates</b>                                   |  |                                   |                   |                    |
| <i>Kontikia andersoni</i>                              | <i>Kontikia andersoni</i>  | WCA9, INNS                        | 1                 | December 2015      |
| <b>Plants</b>  |  |                                   |                   |                    |
| Bluebell   | <i>Hyacinthoides non-scripta x hispanica</i> = <i>H. x massartiana</i> | INNS                              | 1                 | April 2019         |
| Butterfly-bush   | <i>Buddleja davidii</i>  | INNS                              | 4                 | June 2017          |
| Cherry laurel  | <i>Prunus laurocerasus</i>   | INNS                              | 4                 | April 2019         |
| Greater periwinkle                                     | <i>Vinca major</i>   | INNS                              | 1                 | March 2016         |
| Himalayan balsam                                       | <i>Impatiens glandulifera</i>  | WCA9, INNS                        | 4                 | July 2021          |
| Himalayan honeysuckle                                  | <i>Leycesteria formosa</i>   | INNS                              | 1                 | June 2017          |
| Japanese knotweed                                      | <i>Fallopia japonica</i>   | WCA9, INNS                        | 8                 | April 2020         |
| Japanese Rose  | <i>Rosa rugosa</i>   | WCA9, INNS                        | 1                 | June 2017          |
| <i>Lamiastrum galeobdolon</i> subsp. <i>Argentatum</i> | <i>Lamiastrum galeobdolon</i> subsp. <i>argentatum</i> .               | WCA9, INNS                        | 2                 | September 2017     |
| Montbretia   | <i>Crocasmia pottsii x aurea</i> = <i>C. x crocosmiiflora</i>          | WCA9, INNS                        | 3                 | September 2017     |
| Pampas-grass   | <i>Cortaderia selloana</i>   | INNS                              | 1                 | March 2016         |
| Snowberry  | <i>Symphoricarpos albus</i>  | INNS                              | 1                 | June 2017          |
| Spanish bluebell                                       | <i>Hyacinthoides hispanica</i>   | INNS                              | 1                 | March 2016         |
| Virginia-creeper                                       | <i>Parthenocissus quinquefolia</i>                                     | WCA9, INNS                        | 2                 | June 2021          |
| Wall cotoneaster                                       | <i>Cotoneaster horizontalis</i>  | WCA9, INNS                        | 3                 | June 2017          |
| White Stonecrop  | <i>Sedum album</i>   | INNS                              | 1                 | January 2013       |

## Legislation Abbreviation descriptions.

| Legislation: Abbreviations |  |               |  |
|----------------------------|--|---------------|--|
| BAP                        | UK Biodiversity Action Plan  | UKBA          | RSPB UK Birds Amber List (not based on IUCN criteria)  |
| BDir1                      | EU Birds Directive Annexe 1  | UKBR          | RSPB UK Birds Red List (not based on IUCN criteria)  |
| BDir2.1                    | EU Birds Directive Annexe 2.1  | WBA           | RSPB Welsh Birds Amber List (not based on IUCN criteria)   |
| BDir2.2                    | EU Birds Directive Annexe 2.2  | WBR           | RSPB Welsh Birds Red List (not based on IUCN criteria)   |
| Bern                       | Bern Convention on the Conservation of European Wildlife and Natural Habitats  | WCA1.1        | Wildlife & Countryside Act 1981 Schedule 1.1 (Birds which are protected at all times)  |
| Bonn                       | Bonn Convention on the Conservation of Migratory Species of Wild Animals   | WCA1.2        | Wildlife & Countryside Act 1981 Schedule 1.2 (Birds which are protected at certain times)  |
| CITES                      | Convention on International Trade in Endangered Species of Wild Fauna and Flora  | WCA5          | Wildlife & Countryside Act 1981 Schedule 5 (Animals which are protected from killing and taking, possession, disturbance and sale)   |
| EPS                        | European Protected Species   | WCA8          | Wildlife & Countryside Act 1981 Schedule 8 (Plants which are protected)  |
| HDir                       | EU Habitats Directive  | WCA9          | Wildlife & Countryside Act 1981 Schedule 9 (Non-native animals and plants which are established in the wild)   |
| INNS                       | Invasive Non-native Species  | WVP           | IUCN Threat Listing of Welsh Vascular Plants   |
| LBAP                       | Local Biodiversity Action Plan species for the listed area   | LI            | Locally Important within the listed area   |
| LBAP [CLY]                 | Caerphilly County Borough Council Local Biodiversity Action Plan   | LI (SEWBReC)  | Locally Important Species (as identified by local specialists) in SEWBReC area.  |
| NRW                        | Natural Resources Wales Priority Species   | LI (VC##)     | Locally Important Species (as identified by local specialists) in Vice County ##   |
| PBA                        | Protection of Badgers Act 1992   | LI (VC##, LS) | Locally Scarce in Vice County ##   |
| RD1(UK)                    | Red Data Book listing for the UK based on IUCN guidelines (CE= Critically Endangered, EN= Endangered, VU= Vulnerable, NT= Near Threatened, LC=Least Concern) | LI (VC##, LR) | Locally Rare in Vice County ##   |
| RD1 (Wales)                | Red Data Book listing for Wales based on IUCN guidelines   | LI (VC##, EX) | Extinct in Vice County ##  |
| RD2(UK)                    | Red Data Book listing for the UK not based on IUCN guidelines  | LI (VC##, UR) | Under Recorded in Vice County ##   |
| S7                         | Environment (Wales) Act 2016 (Section 7)   | ##            | Vice County number. For more information on Vice Counties visit: <a href="https://www.ukbutterflies.co.uk/webpage.php?name=site_terms">https://www.ukbutterflies.co.uk/webpage.php?name=site_terms</a> |



# Appendix C

## BOTANICAL LIST





**Botanical List - Species abundance classified under ACFOR scale (A-Abundant; C-Common; O-Occasional; R-Rare). L preceding abundance indicates Locally.**

| Common Name                                      | Latin Name  | Abundance (ACFOR scale)<br>L=Locally |
|--|---|--------------------------------------|
| <b>Semi-natural Broadleaved Woodland</b>         |   |                                      |
| Downy birch                                      | <i>Betula pubescens</i>   | F/LA                                 |
| Silver birch                                     | <i>Betula pendula</i>   | F/LA                                 |
| Ash  | <i>Fraxinus excelsior</i>   | O                                    |
| Alder  | <i>Alnus glutinosa</i>  | O/LA                                 |
| Beech  | <i>Fagus sylvatica</i>  | O/LF                                 |
| Larch species                                    | <i>Larix</i> sp.  | O/LF                                 |
| Oak species                                      | <i>Quercus</i> spp.   | O/LF                                 |
| Willow species                                   | <i>Salix</i> spp.   | O/LA                                 |
| <b>Understorey, shrub layer and ground flora</b> |   |                                      |
| Common ivy                                       | <i>Hedera helix</i>   | C/LA                                 |
| Bracken  | <i>Pteridium aquilinum</i>  | F/LA                                 |
| Bramble  | <i>Rubus fruticosus</i> agg.  | F/LA                                 |
| Hazel  | <i>Corylus avellana</i>   | F/LA                                 |
| Hawthorn   | <i>Crataegus monogyna</i>   | F                                    |
| Broom  | <i>Cytisus scoparius</i>  | O/LF                                 |
| Gorse  | <i>Ulex europaeus</i>   | O/LF                                 |
| Traveller's-joy                                  | <i>Clematis vitalba</i>   | O/LF                                 |
| Bluebell   | <i>Hyacinthoides non-scripta</i>  | O                                    |
| Garlic mustard                                   | <i>Alliaria petiolata</i>   | O                                    |
| Butterfly-bush                                   | <i>Buddleja davidii</i>   | O                                    |
| Hart's-tongue                                    | <i>Asplenium scolopendrium</i>  | O                                    |
| Herb-robert                                      | <i>Geranium robertianum</i>   | O                                    |
| Holly  | <i>Ilex aquifolium</i>  | O                                    |
| Fern species                                     | <i>Polypodiophyta</i> spp.  | O                                    |
| Himalayan balsam                                 | <i>Impatiens glandulifera</i>   | R/LA                                 |
| Rhododendron                                     | <i>Rhododendron ponticum</i>  | R                                    |
| Himalayan honeysuckle                            | <i>Leycesteria formosa</i>  | R                                    |
| Privet species                                   | <i>Ligustrum</i>  | R                                    |
| Wood-sorrel                                      | <i>Oxalis acetosella</i>  | R                                    |
| <b>Semi-natural Coniferous Woodland</b>          |   |                                      |
| Birch species                                    | <i>Betula</i> sp.   | O                                    |
| Douglas fir                                      | <i>Pseudotsuga menziesii</i>  | O                                    |
| Larch species                                    | <i>Larix</i> sp.  | O                                    |
| Leyland cypress                                  | <i>Cupressus macrocarpa</i> x<br><i>Xanthocyparis nootkatensis</i> = X<br><i>Cuprocyparis leylandii</i> | O                                    |



|  |   |      |
|--|---|------|
| Scots pine   | <i>Pinus sylvestris</i>   | O    |
| <b>Semi-natural Mixed Woodland</b>                     |   |      |
| Birch species  | <i>Betula</i> sp.   | C    |
| Bramble  | <i>Rubus fruticosus</i> agg.  | F    |
| Bracken  | <i>Pteridium aquilinum</i>  | O    |
| Beech  | <i>Fagus sylvatica</i>  | O/LA |
| Douglas fir  | <i>Pseudotsuga menziesii</i>  | O    |
| Larch species  | <i>Larix</i> sp.  | O/LF |
| Ash  | <i>Fraxinus excelsior</i>   | O/LF |
| Fern species   | <i>Polypodiophyta</i> spp.  | O    |
| Hawthorn   | <i>Crataegus monogyna</i>   | O    |
| Hazel  | <i>Corylus avellana</i>   | O    |
| Holly  | <i>Ilex aquifolium</i>  | O    |
| Oak species  | <i>Quercus</i> sp.  | O    |
| <b>Coniferous Plantation Woodland</b>                  |   |      |
| Douglas fir  | <i>Pseudotsuga menziesii</i>  | O    |
| Larch species  | <i>Larix</i> sp.  | O    |
| Leyland cypress  | <i>Cupressus macrocarpa</i> x<br><i>Xanthocyparis nootkatensis</i> = X<br><i>Cuprocyparis leylandii</i> | O    |
| Norway spruce  | <i>Picea abies</i>  | O    |
| Sitka spruce   | <i>Picea sitchensis</i>   | O    |
| Scots pine   | <i>Pinus sylvestris</i>   | O    |
| Western hemlock-spruce                                 | <i>Tsuga heterophylla</i>   | O    |
| Rhododendron   | <i>Rhododendron ponticum</i>  | R    |
| <b>Dense and Scattered Scrub (and scattered trees)</b> |   |      |
| Bracken  | <i>Pteridium aquilinum</i>  | C/LA |
| Bramble  | <i>Rubus fruticosus</i> agg.  | C/LA |
| Gorse  | <i>Ulex europaeus</i>   | F/LA |
| Birch species  | <i>Betula</i> spp.  | F    |
| Hawthorn   | <i>Crataegus monogyna</i>   | F    |
| Broom  | <i>Cytisus scoparius</i>  | O/LF |
| Broad-leaved dock                                      | <i>Rumex obtusifolius</i>   | O    |
| Ash (saplings/immature)                                | <i>Fraxinus excelsior</i>   | O    |
| Cherry species   | <i>Prunus</i> sp.   | O    |
| Common nettle  | <i>Urtica dioica</i>  | O    |
| Creeping thistle                                       | <i>Cirsium arvense</i>  | O    |
| Dog-rose   | <i>Rosa canina</i>  | O    |
| Fern species   | <i>Polypodiophyta</i> sp.   | O    |
| Foxglove   | <i>Digitalis purpurea</i>   | O    |
| Hard-fern  | <i>Blechnum spicant</i>   | O    |

|  |  |      |
|--|--|------|
| Hart's-tongue  | <i>Asplenium scolopendrium</i>             | O    |
| Holly  | <i>Ilex aquifolium</i>                     | O    |
| Oak species (saplings/immature)                      | <i>Quercus</i> sp.                         | O    |
| Rosebay willowherb                                   | <i>Chamerion angustifolium</i>             | O    |
| Willow species                                       | <i>Salix</i> sp.                           | O/LF |
| Wood avens   | <i>Geum urbanum</i>                        | O    |
| Cotoneaster species                                  | <i>Cotoneaster</i> Sp.                     | R    |
| Hedge bedstraw                                       | <i>Galium album</i>                        | R    |
| Rush species   | <i>Juncus</i> sp.                          | R/LA |
| Spear thistle  | <i>Cirsium vulgare</i>                     | R    |
| St John's-wort species                               | <i>Hypericum</i> sp.                       | R    |
| Tutsan   | <i>Hypericum androsaemum</i>               | R/LF |
| Wall cotoneaster                                     | <i>Cotoneaster horizontalis</i>            | R/LA |
| <b>Scattered Trees</b>                               |  |      |
| Birch species  | <i>Betula</i> spp.                         | C    |
| Hawthorn   | <i>Crataegus monogyna</i>                  | F    |
| Oak species (saplings/immature)                      | <i>Quercus</i> sp.                         | O    |
| Ash  | <i>Fraxinus excelsior</i>                  | O    |
| Beech  | <i>Fagus sylvatica</i>                     | O    |
| Cherry species                                       | <i>Prunus</i> sp.                          | O    |
| Fir species  | <i>Pinophyta</i> sp.                       | O    |
| Hazel  | <i>Corylus avellana</i>                    | O    |
| Holly  | <i>Ilex aquifolium</i>                     | O    |
| Larch species  | <i>Larix</i> sp.                           | O    |
| Scots pine   | <i>Pinus sylvestris</i>                    | R    |
| Sycamore   | <i>Acer pseudoplatanus</i>                 | R    |
| <b>Acid Grassland - Unimproved and Semi-improved</b> |  |      |
| Red fescue   | <i>Festuca rubra</i>                       | C    |
| Sheep's-fescue                                       | <i>Festuca ovina</i>                       | C    |
| Common bent  | <i>Agrostis capillaris</i>                 | F    |
| Mouse-ear-hawkweed                                   | <i>Pilosella officinarum</i>               | F    |
| Moss species   | <i>Bryophyte</i> spp.                      | F    |
| Sheep's sorrel                                       | <i>Rumex acetosella</i>                    | F    |
| Sweet vernal-grass                                   | <i>Anthoxanthum odoratum</i>               | F    |
| Bramble  | <i>Rubus fruticosus</i> agg.               | O    |
| Common sorrel  | <i>Rumex acetosa</i> subsp. <i>acetosa</i> | O    |
| Creeping buttercup                                   | <i>Ranunculus repens</i>                   | O    |
| Gorse  | <i>Ulex europaeus</i>                      | O    |
| Heath bedstraw                                       | <i>Galium saxatile</i>                     | O    |



|   |  |                      |
|---|--|----------------------|
| Pill sedge                                    | <i>Carex pilulifera</i>                    | O                    |
| Tormentil                                     | <i>Potentilla erecta</i>                   | O                    |
| Yorkshire-fog                                 | <i>Holcus lanatus</i>                      | O                    |
| <b>Improved Grassland</b>                     |  |                      |
| Perennial rye-grass                           | <i>Lolium perenne</i>                      | A                    |
| Broad-leaved dock                             | <i>Rumex obtusifolius</i>                  | O                    |
| Common nettle                                 | <i>Urtica dioica</i>                       | O                    |
| Creeping thistle                              | <i>Cirsium arvense</i>                     | O                    |
| Ribwort plantain                              | <i>Plantago major</i>                      | O                    |
| Soft-rush                                     | <i>Juncus effusus</i>                      | O/LA in damper areas |
| <b>Marshy Grassland</b>                       |  |                      |
| Sharp-flowered/jointed rush species           | <i>Juncus</i> spp.                         | C                    |
| Soft-rush                                     | <i>Juncus effusus</i>                      | C                    |
| Purple moor-grass                             | <i>Molinia caerulea</i>                    | O/LA                 |
| Creeping buttercup                            | <i>Ranunculus repens</i>                   | O                    |
| Common nettle                                 | <i>Urtica dioica</i>                       | O                    |
| Thistle species                               | <i>Cirsium</i> sp.                         | O                    |
| Bedstraw species                              | <i>Galium</i> sp.                          | R                    |
| <b>Poor Semi-improved Grassland</b>           |  |                      |
| Creeping buttercup                            | <i>Ranunculus repens</i>                   | C/LA                 |
| Ribwort plantain                              | <i>Plantago lanceolata</i>                 | F                    |
| Bramble                                       | <i>Rubus fruticosus</i> agg.               | O                    |
| Bent species                                  | <i>Agrostis</i> spp.                       | O                    |
| Common nettle                                 | <i>Urtica dioica</i>                       | O                    |
| Common sorrel                                 | <i>Rumex acetosa</i> subsp. <i>acetosa</i> | O                    |
| Creeping thistle                              | <i>Cirsium arvense</i>                     | O                    |
| Daisy   | <i>Bellis perennis</i>                     | O                    |
| Dandelion                                     | <i>Taraxacum officinale</i> agg.           | O                    |
| Mouse-ear-hawkweed                            | <i>Pilosella officinarum</i>               | O                    |
| Moss species                                  | <i>Bryophyte</i> spp.                      | O/LF                 |
| Soft-rush                                     | <i>Juncus effusus</i>                      | O                    |
| Yorkshire-fog                                 | <i>Holcus lanatus</i>                      | O                    |
| Bracken                                       | <i>Pteridium aquilinum</i>                 | R                    |
| Gorse   | <i>Ulex europaeus</i>                      | R                    |
| <b>Dense/Continuous and Scattered Bracken</b> |  |                      |
| Bracken                                       | <i>Pteridium aquilinum</i>                 | A                    |
| Bramble                                       | <i>Rubus fruticosus</i> agg.               | F                    |
| Creeping buttercup                            | <i>Ranunculus repens</i>                   | O                    |
| Hard-fern                                     | <i>Blechnum spicant</i>                    | O                    |
| Hart's-tongue                                 | <i>Asplenium scolopendrium</i>             | O                    |

|   |  |      |
|---|--|------|
| Rosebay willowherb                                    | <i>Chamerion angustifolium</i>                       | O    |
| <b>Dry Dwarf Shrub Heath</b>                          |  |      |
| Heather   | <i>Calluna vulgaris</i>                              | C    |
| Gorse   | <i>Ulex europaeus</i>                                | C    |
| Broom   | <i>Cytisus scoparius</i>                             | F    |
| Bilberry  | <i>Vaccinium myrtillus</i>                           | O    |
| Mouse-ear hawkweed                                    | <i>Pilosella officinarum</i>                         | O    |
| <b>Lichen/bryophyte heath</b>                         |  |      |
| Cladonia species                                      | <i>Cladonia</i> sp.                                  | C    |
| Moss species  | <i>Bryophyte</i> spp.                                | C    |
| Mouse-ear-hawkweed                                    | <i>Pilosella officinarum</i>                         | O    |
| <b>Marginal and Inundation Vegetation</b>             |  |      |
| Rush species  | <i>Juncus</i> spp.                                   | F/LC |
| Bulrush   | <i>Typha latifolia</i>                               | O/LC |
| Common water-starwort                                 | <i>Callitriche stagnalis</i>                         | O/LA |
| Hemlock water-dropwort                                | <i>Oenanthe crocata</i>                              | O    |
| Pennywort species                                     | <i>Hydrocotyle</i> sp.                               | O    |
| Opposite-leaved golden-saxifrage                      | <i>Chrysosplenium oppositifolium</i>                 | O/LA |
| Sedge species   | <i>Carex</i> sp.                                     | O    |
| Tufted hair-grass                                     | <i>Deschampsia cespitosa</i> subsp. <i>cespitosa</i> | O    |
| Floating soft-grass                                   | <i>Glyceria fluitans</i>                             | R/LC |
| Pendulous sedge                                       | <i>Carex pendula</i>                                 | R    |
| <b>Ephemeral/Short Perennial</b>                      |  |      |
| Creeping buttercup                                    | <i>Ranunculus repens</i>                             | C    |
| Pearly everlasting                                    | <i>Anaphalis margaritacea</i>                        | O/LA |
| Ribwort plantain                                      | <i>Plantago lanceolata</i>                           | O    |
| Selfheal  | <i>Prunella vulgaris</i>                             | O    |
| Weld  | <i>Reseda luteola</i>                                | O    |
| Dog-violet species                                    | <i>Viola riviniana</i>                               | R    |
| Mullein species                                       | <i>Verbascum</i> sp.                                 | R    |
| <b>Species-poor Hedgerows (intact and with trees)</b> |  |      |
| Beech   | <i>Fagus sylvatica</i>                               | C/LA |
| Ash   | <i>Fraxinus excelsior</i>                            | O    |
| Bramble   | <i>Rubus fruticosus</i> agg.                         | O/LA |
| Dogwood   | <i>Cornus sanguinea</i>                              | O    |
| Hazel   | <i>Corylus avellana</i>                              | O/LA |
| Holly   | <i>Ilex aquifolium</i>                               | O    |



# Appendix D


## TARGET NOTES



**Target Notes (locations illustrated on Drawings GC4277-WSP-74-XX-M2-L-3010 to 11)**

| Target Note No. | Grid Reference | Description  |
|-----------------|----------------|--|
| 1               | ST2149591204   | <p>Running water flowing down bank into ditch, forming small ephemeral pond</p>  |
| 2               | ST2140291179   | <p>Rhododendron (<i>Rhododendron ponticum</i>)</p>                             |
| 3               | ST2114491095   | <p>Standing water - small pond within depression, likely ephemeral</p>         |






|   |              |  |
|---|--------------|--|
| 4 | ST2112091072 | <p>Himalayan honeysuckle (<i>Leycesteria formosa</i>)</p>    |
| 5 | ST2088391021 | <p>Rhododendron</p>   |
| 6 | ST2067190987 | <p>Potential raptor splash on conifer tree (highlighted with red circle) and potential nest higher up in branches (nest not shown).</p>  |



|   |              |  |
|---|--------------|--|
| 7 | ST2033790711 | <p>Ditch with standing water and ephemeral vegetation running along track</p>                    |
| 8 | ST2024890688 | <p>Himalayan balsam (<i>Impatiens glandulifera</i>) died back , only dead stems observable</p>  |
| 9 | ST1954190756 | <p>Domestic beekeeping at Ynys Hywel Outdoor Centre.</p>                                       |



|    |              |  |
|----|--------------|--|
| 10 | ST1920090846 | <p>Rhododendron</p>    |
| 11 | ST1910790881 | <p>Rhododendron</p>   |
| 12 | ST1768991476 | <p>Exposed rocky cliff - 10m max. height, ~80m length</p>  |



|           |                     |  |
|-----------|---------------------|--|
| <p>13</p> | <p>ST1737391512</p> | <p>Neolithic barrow (burial ground) – potential basking habitat for reptiles</p>                       |
| <p>14</p> | <p>ST1710991863</p> | <p>Marshy depressions containing ephemeral waterbodies and abundant rush (<i>Juncus</i>) species</p>  |
| <p>15</p> | <p>ST1823590196</p> | <p>Vole species cache and droppings</p>    |



|           |                     |  |
|-----------|---------------------|--|
| <p>16</p> | <p>ST1810990383</p> | <p>Abundant yellow meadow-ant (<i>Lasius flavus</i>) hills in small patch of grassland amid bracken</p>  |
| <p>17</p> | <p>ST1807990490</p> | <p>Bracken becomes more scattered towards field margin</p>    |
| <p>18</p> | <p>ST1789690461</p> | <p>Marshy grassland around wet ditch</p>   |





|           |                     |  |
|-----------|---------------------|--|
| <p>19</p> | <p>ST1775490300</p> | <p>Exposed rock – potential basking habitat for reptiles</p>                                 |
| <p>20</p> | <p>ST1785390126</p> | <p>Strip of south facing rocky ground adjacent to concrete channel - reptile potential</p>  |
| <p>21</p> | <p>ST1774990088</p> | <p>Small area of bryophyte heath 10x10m</p>    |




|    |              |  |
|----|--------------|--|
| 22 | ST1778890057 | <p>Bare ground spoil next to scrub - basking potential for reptiles</p>    |
| 23 | ST1789890049 | <p>Man-made drainage channel running north to south alongside Tip 1.</p>  |
| 24 | ST1790289956 | <p>Man-made channel containing low volumes of running water</p>          |





|           |                     |  |
|-----------|---------------------|--|
| <p>25</p> | <p>ST1788089947</p> | <p>Man-made lined channel and culvert</p>    |
| <p>26</p> | <p>ST1789889937</p> | <p>Potential bat roost feature - exposed heart-rot cavity from floor level, unknown depth, DBH 1.3 m</p>  |



|           |                     |   |
|-----------|---------------------|---|
| <p>27</p> | <p>ST1778589844</p> | <p>Drainage channel junction</p>    |
| <p>28</p> | <p>ST1775789824</p> | <p>Deep silt (danger warnings)</p>   |
| <p>29</p> | <p>ST1808089630</p> | <p>Wall cotoneaster (<i>Cotoneaster horizontalis</i>), 12 X 3 m area</p>  |



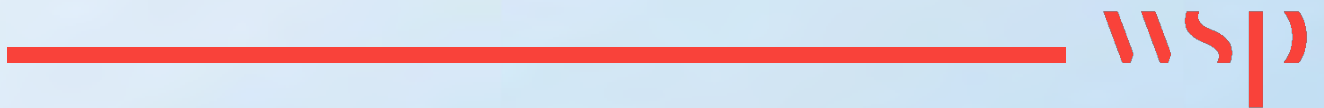
|                  |                     |  |
|------------------|---------------------|--|
| <p><b>30</b></p> | <p>ST1804889590</p> | <p>Deep silt in three adjacent areas (danger warnings)</p>                         |
| <p><b>31</b></p> | <p>ST1775089532</p> | <p><i>Cotoneaster</i> sp. and deep concrete channel</p>                           |
| <p><b>32</b></p> | <p>ST1811089441</p> | <p>Pond - waterfall feeds in, controlled flow out into wide stepped channel</p>  |



|    |              |   |
|----|--------------|---|
| 33 | ST1813789373 | Deep vertical culvert<br> |
|----|--------------|---|

# Appendix E

**BIRD AND MAMMAL SIGHTINGS/SIGNS**







**Table E-1 – Bird and Mammal Sightings/Signs**

| <b>Common name</b>       | <b>Scientific name</b>         |
|--------------------------|--------------------------------|
| <b>Birds</b>             |                                |
| Blackbird                | <i>Turdus merula</i>           |
| Blue tit                 | <i>Cyanistes caeruleus</i>     |
| Bullfinch                | <i>Pyrrhula pyrrhula</i>       |
| Buzzard                  | <i>Buteo buteo</i>             |
| Carrion crow             | <i>Corvus corone</i>           |
| Chaffinch                | <i>Fringilla coelebs</i>       |
| Chiffchaff               | <i>Phylloscopus collybita</i>  |
| Dunnock                  | <i>Prunella modularis</i>      |
| Fieldfare                | <i>Turdus pilaris</i>          |
| Goldfinch                | <i>Carduelis carduelis</i>     |
| Great spotted woodpecker | <i>Dendrocopos major</i>       |
| Great tit                | <i>Parus major</i>             |
| Green woodpecker         | <i>Picus viridis</i>           |
| Jackdaw                  | <i>Corvus monedula</i>         |
| Jay                      | <i>Garrulus glandarius</i>     |
| Kestrel                  | <i>Falco tinnunculus</i>       |
| Linnet                   | <i>Linaria cannabina</i>       |
| Long-tailed tit          | <i>Aegithalos caudatus</i>     |
| Magpie                   | <i>Pica pica</i>               |
| Meadow pipit             | <i>Anthus pratensis</i>        |
| Mistle thrush            | <i>Turdus viscivorus</i>       |
| Raven                    | <i>Corvus corax</i>            |
| Red kite                 | <i>Milvus milvus</i>           |
| Redwing                  | <i>Turdus iliacus</i>          |
| Robin                    | <i>Erithacus rubecula</i>      |
| Siskin                   | <i>Carduelis spinus</i>        |
| Skylark                  | <i>Alauda arvensis</i>         |
| Song thrush              | <i>Turdus philomelos</i>       |
| Sparrowhawk              | <i>Accipiter nisus</i>         |
| Starling                 | <i>Sturnus vulgaris</i>        |
| Stonechat                | <i>Saxicola rubicola</i>       |
| Woodpigeon               | <i>Columba palumbus</i>        |
| Wren                     | <i>Troglodytes troglodytes</i> |
| <b>Mammals</b>           |                                |



| <b>Common name</b>                     | <b>Scientific name</b>       |
|--|------------------------------|
| Badger (latrines, snuffle holes, hair) | <i>Meles meles</i>           |
| Brown hare (sighting)                  | <i>Lepus europaeus</i>       |
| Fox (scat & footprints)                | <i>Vulpes vulpes</i>         |
| Grey squirrel (sightings)              | <i>Sciurus carolinensis</i>  |
| Mole (mole hills)                      | <i>Talpa europaea</i>        |
| Rabbit (sightings, droppings, digging) | <i>Oryctolagus cuniculus</i> |





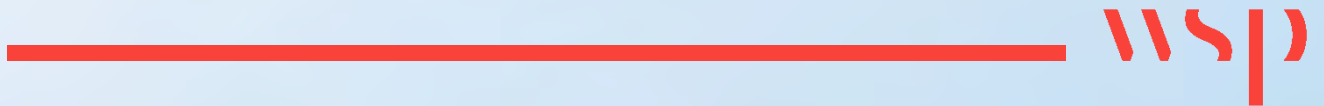
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# V3-S09/0002

## **GROUND LEVEL TREE ASSESSMENT FOR BATS REPORT**







Energy Recovery Investments Ltd

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# **BEDWAS TIPS**

Ground Level Tree Assessment Report





Energy Recovery Investments Ltd

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## **BEDWAS TIPS**

### Ground Level Tree Assessment Report

**TYPE OF DOCUMENT (VERSION) CONFIDENTIAL**

**PROJECT NO. GC/4277**

**OUR REF. NO. GC4277-WSP-74-XX-RP-L-0005**

**DATE: AUGUST 2023**

**WSP**

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# QUALITY CONTROL

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| Issue/revision | First issue   | Revision 1 | Revision 2 | Revision 3 |
|----------------|---|------------|------------|------------|
| Remarks        |   |            |            |            |
| Date           | 3 <sup>rd</sup> August 2023   |            |            |            |
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| Project number | GC4277  |            |            |            |
| Report number  | GC4277-WSP-74-XX-RP-L-0005 P01  |            |            |            |
| File reference | GC4277-WSP-74-XX-RP-L-0005  |            |            |            |



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# NON TECHNICAL SUMMARY

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WSP in the UK were commissioned by Energy Recovery Investments Ltd to undertake a Ground Level Tree Assessment (GLTA) to identify trees with Potential Roost Features (PRF) for bats within the Bedwas Tips site located north-east of Bedwas, Caerphilly.

GLTA surveys were undertaken on trees in January 2023 when trees were bare and PRFs were visible.

The GLTA surveys identified 46 trees with features suitable for use by bats, with one tree categorised as having High potential, 13 trees with Moderate potential and 32 trees with Low potential. The majority of the trees on site were within conifer plantation however, pockets of mature broadleaved woodland provided trees with roosting potential.

The proposed development is expected to cause short-term disturbance to bat populations during the site preparation and construction phase.

Felling of trees with roost features is an expected long-term impact to local tree roosting bat populations. Providing mitigation is followed and ensuring any roost features removed are replaced on a 1:1 basis the long-term impact is minor.

Installation of lighting is likely to cause short to medium-term negative impacts to foraging and commuting bats, therefore any lighting installed must be bat friendly and PIR activated to minimise impact.

Further survey work has been scheduled during the active season is required to assess the habitat use by local bat populations within areas of expected significant change.

Mitigation measures are dependent upon the activity survey results.

General bat mitigation must be followed for the duration of the proposed works. This includes retaining habitats around the Scheme; carry out vegetation clearance in winter where possible; carrying out work during daylight hours where possible; if night-time work is required lighting should be kept to a minimum and not spill onto woodland habitat; all site operatives should receive a toolbox talk; and work must cease if a bat roost is discovered during the construction period.



# 1 INTRODUCTION

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WSP was commissioned by Energy Recovery Investments Ltd to undertake Ground Level Tree Assessments (GLTA) at Bedwas Tips (approximate Central Grid Reference (CGR): ST 17668 90526) to identify potential constraints relating to bat roosts in trees to the proposed development. For the duration of the report the proposed works will be described as “the Scheme” and the area surveyed in relation to the Scheme will be described as “the Survey Area.”

This report includes details of the survey methodologies and results and contains recommendations for further survey, and compensation mitigation measures and post-construction monitoring where needed.

## 1.1 GENERAL SITE DESCRIPTION AND PROPOSED WORKS

The Scheme is located within 1 km of Bedwas, Caerphilly County Borough Council (CCBC), and covers a large area including two existing coal tips on Mynydd y Grug and a haul road route connecting the northern tip site with the A467/B4251 roundabout.

The purpose of the works is to restore the CCBC owned degraded and derelict land of the Bedwas coal spoil tips to a more natural habitat in keeping with the surrounding area. In the process, high ash coal will be extracted from the colliery spoil which will provide the means of funding the restoration. The land is to be suitable for upland grazing, thereby enhancing the natural environment and improving the resilience of ecosystems and ecological networks by:

- Re-landscaping in keeping with the natural character of the area
- Improving site drainage and run-off water quality
- Improving physical ground conditions and land stability
- Promoting soil recovery, revegetation, and enhanced biodiversity

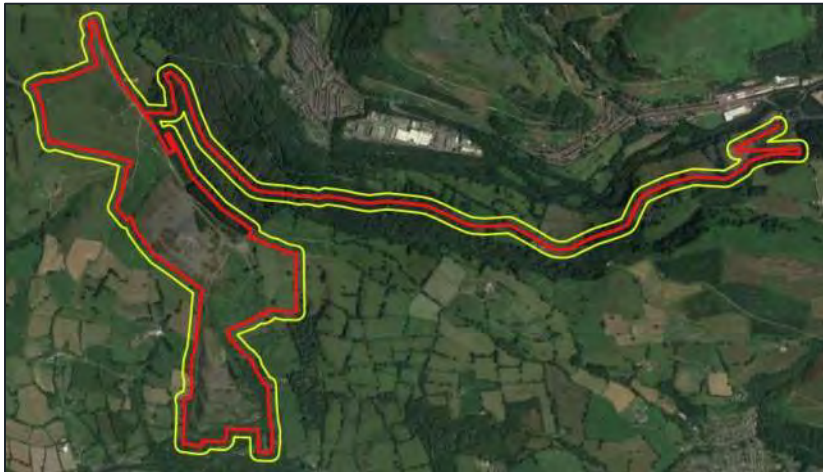
The proposed scheme is likely to result in community benefits, including providing mineral products which are essential for housing and infrastructure. The proposed scheme will also deliver a high standard of restoration by remediating a derelict site and restoring it to upland grazing, thus leading to vast improvement of the local environment.

The proposed development will operate over a period of approximately six years and will be conducted in the following stages:

- Construction of the following: access road, clean water pond, sit bunding and water drainage channels, site water collection and treatment ponds, process plant, portable buildings for workers.
- Excavation
- Deposition
- Reclamation
- Decommissioning
- Aftercare (5-year period)

The location of the proposed works is illustrated in Figure 1-1.

**Figure 1-1 - Scheme location. Red line indicates the Scheme area and yellow line indicated the Survey Area.**



## 1.2 OBJECTIVES OF SURVEY

The objectives of the surveys were to obtain sufficient data to:

- Survey potential roost features (PRFs) in trees within the Survey Area to assess the potential for tree roosting bat species.
- Identify potential species currently using the Survey Area through desktop data and evidence found during the GLTA surveys.
- Assess whether the proposed development would be likely to have an impact on the species present.

## 1.3 LEGISLATION AND POLICY CONTEXT

Bats (and their habitat) are protected under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Under this legislation it is an offence to:

deliberately capture, kill or injure a bat;

- deliberately disturb wild bats (disturbance is defined as any activity likely to impair the ability to breed, reproduce, rear or nurture young, hibernate, migrate and/or significantly affect the local distribution or abundance of the species);
- damage or destroy a breeding site or resting place (i.e., roost); and
- possess, control, transport, sell, exchange, offer for sale or exchange, any live or dead animal or part of an animal.

Bats are also partially protected under the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally or recklessly:

- damage or destroy any structure or place which bats use for shelter or protection;
- disturb bats while occupying a structure or place which is used for shelter or protection; and
- obstruct access to any structure or place which bats use for shelter or protection.

Noctule bat (*Nyctalus noctula*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and brown long-eared bat (*Plecotus auritus*) are also listed on Section 7 of the Environment (Wales) Act 2016 as species of principal importance for maintaining and enhancing biodiversity in Wales. Additionally, under Section 6 of the Act, public authorities (including Welsh Government) must “seek to maintain and enhance biodiversity” and to “promote the resilience of ecosystems”.



## 2 METHODOLOGY

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### 2.1 DESK STUDY

The South East Wales Biological Records Centre (SEWBRc) was consulted in December 2022 for information on bats within a 5 km radius of the Scheme for the Preliminary Ecological Appraisal Report (WSP (unpublished), 2023; SEWBRc, 2022). The results of this search are summarised in Appendix A.

The Multi-Agency Geographic Information for the Countryside (MAGIC) website (MAGIC, 2023) was accessed in January 2023 to search for additional statutory designated sites e.g., Special Areas of Conservation (SAC) sites specifically designated for bats. Natural Resources Wales' online designated site search was then utilised to obtain citations for relevant statutory site designations identified (NRW, 2020).

The CCBC Tree Preservation Orders (TPOs) interactive map was consulted in December 2022 to identify TPOs within 100 m of the Scheme (CCBC, 2022).

### 2.2 GROUND LEVEL TREE ASSESSMENT

A Ground Level Tree Assessment (GLTA) was carried out on all trees within the study area in January 2023. The surveys were undertaken during optimal weather conditions (i.e., dry and sunny).

Surveys were conducted from the ground, using close focusing binoculars, an endoscope, and high power LED Lenser hand torches. Tree locations were recorded on a Samsung Galaxy Tab S7 using the QField for QGIS application.

All potential roost features (PRFs) identified that were considered suitable for use by roosting bats were recorded with features referenced using the Bat Tree Habitat Key (BTHK, 2018). These included: natural holes; woodpecker holes; cracks/splits in major limbs; loose bark; hollows/cavities; dense epicormic growth; ivy cover; and trees supporting bird or bat boxes.

Features within stems and limbs that were accessible from ground level were also searched for evidence of bat use and signs of roosting bats. These included the presence of bat droppings, scratches, smoothing and staining in/around or below possible points of access/egress; presence of dead bats; distinctive odour of bats; and presence of hibernating bats.

Each tree was then assigned a level of bat roost potential in line with the BCT Best Practice Guidelines (Collins, J. (Ed) 2016) as shown in Table 1 below.

Only trees with a bat roost potential of "low" or above were recorded (i.e., trees with negligible potential were not recorded).

**Table 2-1 – Guidelines for assessing the suitability of trees as bat roosts, adapted from BCT Guidelines, Table 4.1 p.35 (Collins, J. (Ed) 2016).**

| Suitability              | Description<br>Roosting Habitats   |
|--------------------------|--|
| Negligible               | Negligible habitat features on tree likely to be used by roosting bats.  |
| Low                      | 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. This system of categorisation aligns with BS8596:2015 Surveying for bats in trees and woodlands (BSI, 2015)   |
| Moderate                 | A structure or tree with one or more potential roost sites that could be used due to their size, shelter, protection, conditions (for example in terms of temperature, humidity, height above ground level, light levels or levels of disturbance) 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). |
| 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 (for example in terms of temperature, humidity, height above ground level, light levels or levels of disturbance) and surrounding habitat.  |
| Known or confirmed roost | Confirmed bat roost with field evidence supporting the presence of bats e.g., droppings, scratch marks, grease marks or urine staining.  |

## 2.3 SURVEY CONSTRAINTS

### 2.3.1 SURVEY

During the survey in January 2023 there were a number of trees located within the survey area that were not accessible due to the presence of dense scrub. These trees were allocated a low potential for roosting bats as a precaution.

### 2.3.2 GENERAL

Any ecological survey can only identify what was present on site at the time it was conducted, and habitat use by species can change over time. The length of time that the survey data remains valid will depend on a case-by-case basis, but it is generally considered that if the development or proposed works do not commence within 2 years of the date of this report an update may be required.



### 3 RESULTS

#### 3.1 DESKTOP SURVEY

The Scheme is not located within 5 km of any statutory designated bat sites therefore designated sites will no longer be considered in this report.

SEWBRcC records returned 948 records of bats within 5 km of the Scheme from the last 10 years, 3 of which fall within 100 m of the Scheme and a further 47 of the recorded are located within 1 km. The nearest record was for a common pipistrelle (*Pipistrellus pipistrellus*) located approximately 20 m north of the western end of the haul road from June 2015. The closest roost record was located approximately 390 m north of the eastern end of the haul road in Wattsville. The roost was initially recorded in March 2021 as unconfirmed species (a bat (*Chiroptera*)) and then in Summer 2021 was recorded as a maternity roost for pipistrelle bat species (*Pipistrellus*).

Bat species identified within 5 km are shown in Appendix A, Local Record Centre Bat Data.

There were at least 40 Tree Preservation Orders (TPOs) located within 100 m of the Scheme area, including individual TPO Trees and TPO Groups, Areas and Woodlands. The majority of the TPO Trees and Groups were within Graig Goch Local Nature Reserve (LNR) which the haul road passes directly through. There was also a small TPO Group and single TPO Tree located west of the bottom tip area.

None of the trees identified with a TPO are expected to be removed in association with the proposed works and therefore will no longer be considered in this report.

#### 3.2 GROUND LEVEL TREE ASSESSMENT (GLTA)

During the GLTA 46 trees were identified with potential for roosting bats. Of these 46 trees one tree was identified as having high potential, 13 were identified with moderate potential and 32 with low potential. Additionally, a rock face was identified to have low potential to support roosting bats.

A summary of the survey results are provided in Table 3-1 and full survey results are provided in Appendix B. Locations of the trees can be found in Drawing GC4277-WSP-74-XX-M2-L-3002.

**Table 3-1 – Ground Level Tree Assessment Results**

| Tree No. | Grid Reference | Bat Roost Features  | Tree Suitability |
|----------|----------------|---|------------------|
| 1        | ST 21358 91342 | North facing rot-hole within stem.                                      | Low              |
| 2        | ST 21195 91252 | Multiple rot-holes throughout the tree within the stem.                 | High             |
| 3        | ST 21587 91240 | South facing hazard-beam.   | Low              |
| 4        | ST 21368 91210 | Multiple features throughout the stem.                                  | Low              |
| 5        | ST 21335 91153 | East facing butt-rot with a mouse nest present.                         | Moderate         |
| 6        | ST 21335 91144 | South facing fired damaged with butt.                                   | Low              |
| 7        | ST 21352 91153 | South-west facing hazard-beam and three west facing knot holes on stem. | Low              |
| 8        | ST 21315 91143 | Three south facing rot-holes on stem.                                   | Low              |



| Tree No. | Grid Reference | Bat Roost Features   | Tree Suitability |
|----------|----------------|--|------------------|
| 9        | ST 21251 91140 | South facing rot-hole on stem.   | Low              |
| 10       | ST 21255 91131 | South facing butt-rot.   | Moderate         |
| 11       | ST 21260 91113 | Multiple knot-holes throughout limbs.  | Low              |
| 12       | ST 20543 90986 | Multiple callus rolls throughout stem.   | Low              |
| 13       | ST 20032 90589 | North-east facing rot-hole on limb.  | Low              |
| 14       | ST 19593 90757 | Thick stemmed ivy.   | Low              |
| 15       | ST 19574 90758 | Several hazard-beam features throughout tree.  | Moderate         |
| 16       | ST 19526 90727 | Multiple features including east facing callus roll, multiple rot holes and tear outs. | Low              |
| 17       | ST 19354 90791 | South-east facing rot hole in stem.  | Low              |
| 18       | ST 19321 90809 | South facing flute and knot holes.   | Low              |
| 19       | ST 19268 90837 | Two trees with south-west facing features.   | Low              |
| 20       | ST 19174 90880 | Wounds throughout stem.  | Low              |
| 21       | ST 19133 90887 | Wounds throughout stem.  | Low              |
| 22       | ST 18980 90908 | Rot-holes throughout stem.   | Moderate         |
| 23       | ST 18961 90913 | South facing woodpecker-hole in stem.  | Moderate         |
| 24       | ST 18888 90929 | Rot-holes throughout stem.   | Moderate         |
| 25       | ST 18663 90933 | Thick-stemmed ivy.   | Low              |
| 26       | ST 17532 91782 | Compression-fork in stem.  | Low              |
| 27       | ST 17541 91788 | Butt-rot.  | Low              |
| 28       | ST 17476 91328 | Multiple features including south facing wound in limb, fluting and stem cavities.     | Low              |
| 29       | ST 17486 91317 | South facing butt-rot and cavity at top of rot area.                                   | Moderate         |
| 30       | ST 17998 90700 | Two west facing hazard-beam in limb.   | Low              |
| 31       | ST 18077 90624 | North-east facing knot-hole in stem.   | Low              |
| 32       | ST 18075 90585 | South-facing rot-hole in limb.   | Low              |
| 33       | ST 18076 90571 | Shearing crack in stem.  | Low              |
| 34       | ST 18070 90520 | Two north-west facing knot-holes in stem.  | Low              |
| 35       | ST 18058 90517 | North facing rot hole in stem and compression fork.                                    | Moderate         |
| 36       | ST 18030 90505 | South-east facing knot-hole in stem.   | Low              |
| 37       | ST 18334 90505 | East-facing butt-rot.  | Moderate         |





| Tree No.  | Grid Reference | Bat Roost Features  | Tree Suitability |
|-----------|----------------|---|------------------|
| 38        | ST 17672 90396 | East facing flute in stem.  | Low              |
| 39        | ST 17658 89889 | Nine mature beech not accessible, surveyed from distance with binoculars and given precautionary suitability. | Low              |
| 40        | ST 17678 89755 | West facing butt-rot and knot holes.  | Moderate         |
| 41        | ST 18103 89533 | South-facing butt-rot.  | Low              |
| 42        | ST 18094 89533 | North facing woodpecker-hole in stem.   | Moderate         |
| 43        | ST 17953 89526 | South facing rot-hole in stem on pollarded tree.  | Low              |
| 44        | ST 18123 89675 | West facing woodpecker-hole in stem.  | Moderate         |
| 45        | ST 17896 89921 | East facing knot-hole in limb.  | Low              |
| 46        | ST 17902 89945 | North-west facing butt-rot.   | Moderate         |
| Rock face | ST 17661 91505 | Multiple cavities within rock face.   | Low              |

## **4 EVALUATION OF IMPACTS**

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### **4.1 SHORT TERM IMPACTS: DISTURBANCE**

Multiple trees were identified as having potential for roosting bats within the site boundary. Any bats roosting in trees during the excavation and remediation stages are at risk of short-term disturbance from the proposed works.

The proposed works may cause short term disturbance to foraging and commuting bats during the site preparation and operational phases particularly within the eastern extent of the haul road where trees will be removed prior to excavation work commencing on the new link to the Country Park access road. Removal of scrub and trees on the tips will also reduce foraging opportunities and may fragment commuting routes.

### **4.2 LONG TERM IMPACTS: DISTURBANCE, ROOST DESTRUCTION, LOSS OR MODIFICATION AND ISOLATION OF FORAGING HABITAT**

Trees with potential for roosting bats were identified in multiple areas where operational activity is expected to be high, particularly along the haul road. Bats roosting within trees are expected to be negatively impacted by noise and vibration disturbance from operational activity.

Any trees identified with bat potential being removed will have a negative impact on bats due to the loss of potential roost sites.

Security and operational lighting is likely to negatively impact foraging and commuting bats in the short and medium-term around the plant storage/processing area. Species that are adversely affected by increases in ambient light levels may be deterred from using trees surrounding the Scheme area for roosting and may cause a decrease in the number of bats using the Scheme area for foraging and commuting.

Lighting will be less of an issue during winter months when bats are hibernating, and it is at this time of year that lights will see a greater level of use.

### **4.3 MAINTAINING FAVOURABLE STATUS FOR BATS**

Any trees identified with high or moderate potential for roosting bats can hold a significant roost or a large number of bats. If these trees are removed there is potential for a negative impact on the local breeding population of bats with removal of a potential maternity roost or hibernation roost sites.

Bat species using the site for foraging and commuting will be negatively impacted with the installation of operational and security lighting. Mitigation will be required to ensure a favourable status for bats is maintained.



## 5 RECOMMENDATIONS

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### 5.1 FURTHER SURVEY

To assess the current species composition of foraging and commuting bats further survey has been scheduled. Static detectors should be installed within the area of woodland on the eastern extent of the haul road where trees are expected to be felled due to significant habitat change. The static detectors are due to be installed during the bat active period (May to October).

The information from the static recordings will allow for an evaluation of the value of the site for bats.

Trees identified on site that have a low, moderate or high bat potential will need further assessment either by way of tree climbing to fully inspect PRFs, or through emergence/return to roost surveys (moderate and high potential) should any require removal to facilitate works on site.

### 5.2 MITIGATION AND COMPENSATION

#### 5.2.1 TREE FELLING

All trees with potential bat roost features will have the roost features inspected prior to work commencing on felling. Should any trees be found to have bats present then work will cease, and an appropriately licenced ecologist contacted. An NRW protected species licence will be required prior to felling should bats be found to be present.

All trees with potential roost features and no bats present will be soft felled with limbs and stems lowered to the ground with roost feature facing upwards and left for 24 hours for any bats that may be present but not visible, to leave the trees safely.

Trees felled that contain potential bat roost features shall have new bat boxes erected in nearby woodland at a 1:1 ratio for compensation of features lost. Boxes recommended for use are Schwegler 1FF, 2FN, 2F and 1FS (Example of bat box supplier: <https://www.nhbs.com/1ff-schwegler-bat-box-with-built-in-wooden-rear-panel>). Alternatively, roost features could be removed from tree limbs or stems with cuts made at least 250 mm either side of the feature, fixing straps or chains fitted and features then attached to other woodland trees nearby.

#### 5.2.2 LIGHTING

Any lighting installed in association with the Scheme should be discussed with an experienced ecologist and be appropriate for bats such as:

- Lighting should be activated with a Passive Infrared sensor (PIR).
- Lighting should be directional and shielded to minimise spill into the surrounding woodland habitat.
- Luminaires should be LED and should not exceed a temperature of 3000 K.

These would also help reduce the 'vacuum effect' normally experienced when using white light containing a blue element which attracts invertebrates away from nearby habitats reducing food availability to light-averse species.

#### 5.2.3 GENERAL BAT MITIGATION

Mitigation is dependent upon results of the activity surveys.

Standard bat mitigation should be followed during construction as follows:

- Habitats around the Scheme should be retained as far as possible and damage to habitats should be avoided where possible. Where it is necessary to clear vegetation, this work should be carried out during winter months to minimise impacts upon foraging bats.

- Work on site should be carried out during daylight hours; commencing 1 hour post sunrise and 1 hour pre-sunset, to reduce disturbance to bats utilising the site area for commuting and foraging. If night-time working is unavoidable, then artificial construction lighting is to be kept to a minimum and should be directional and positioned to prevent excessive light spill from the construction area onto the woodland habitat. Advice should be sought from a suitably qualified ecologist.
- All site operatives should receive a toolbox talk from a suitably experienced ecologist prior to commencement of works. This should outline any constraints relating to bats and other affected species and cover actions to be taken in the event of unexpectedly discovering any bats or roosts.

### 5.3 ENHANCEMENT OPPORTUNITIES

**Bat boxes** - Three 'summer roost' crevice bat boxes are recommended to be installed within the woodland at the lower altitude points on site and at the base of the lower tips under guidance of an ecologist. Bat boxes can also be installed within the Ynys Hwyl Farm site to further enhance roosting opportunities and educational resources. These should be erected on a tree located away from any lighting and each box positioned facing north, south-east and south-west to give a range of temperatures throughout the season. Recommended make and model: Treble or Double Crevice; NHBS reference #187784/ #187782; available at: <https://www.nhbs.com/improved-crevice-bat-box>.

**Additional planting** – Planting grassland edges surrounding the woodland habitats with a variety of plant species to enhance the area for invertebrates as additional food source for bats. Examples plant species such as lavender and honeysuckle.



## 6 REFERENCES

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- Bat Conservation Trust (2018). *Guidance Note 08/18: Bats and artificial lighting in the UK. Bats and the Built Environment series*. London.
- Bat Tree Habitat Key (BTHK; 2018) *Bat Roosts in trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals*. Pelagic Publishing. Exeter.
- Bat Rock Habitat Key (BRHK; 2021) *Bat Roosts in Rock: A Guide to Identification and Assessment for Climbers, Cavers and Ecology Professionals*. Pelagic Publishing. Exeter.
- Collins, J., (ed.) (2016). *Bat Surveys for Professional Ecologists. Good Practice Guidelines (3rd edition)*. The Bat Conservation Trust, London.
- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. HMSO.
- Environment (Wales) Act 2016. HMSO
- Google Satellite (2023)
- MAGIC (2018). Multi-Agency Geographic Information System.
- Mitchell-Jones, A.J. (2004). *Bat mitigation guidelines*. English Nature. Peterborough. ISBN 1 85716 7813.
- Mitchell-Jones, A.J. and McLeish, A.P., (2004). *The Bat Worker's Manual, 3rd Edition*, Joint Nature Conservation Committee.
- South East Wales Biodiversity Records Centre (SEWBReC; 2022) Biodiversity Information Search – Bedwas Tips [Ref: 700956].
- Wildlife and Countryside Act 1981 (as amended). HMSO.
- WSP (unpublished 2023) Bedwas Tips - Preliminary Ecological Appraisal.

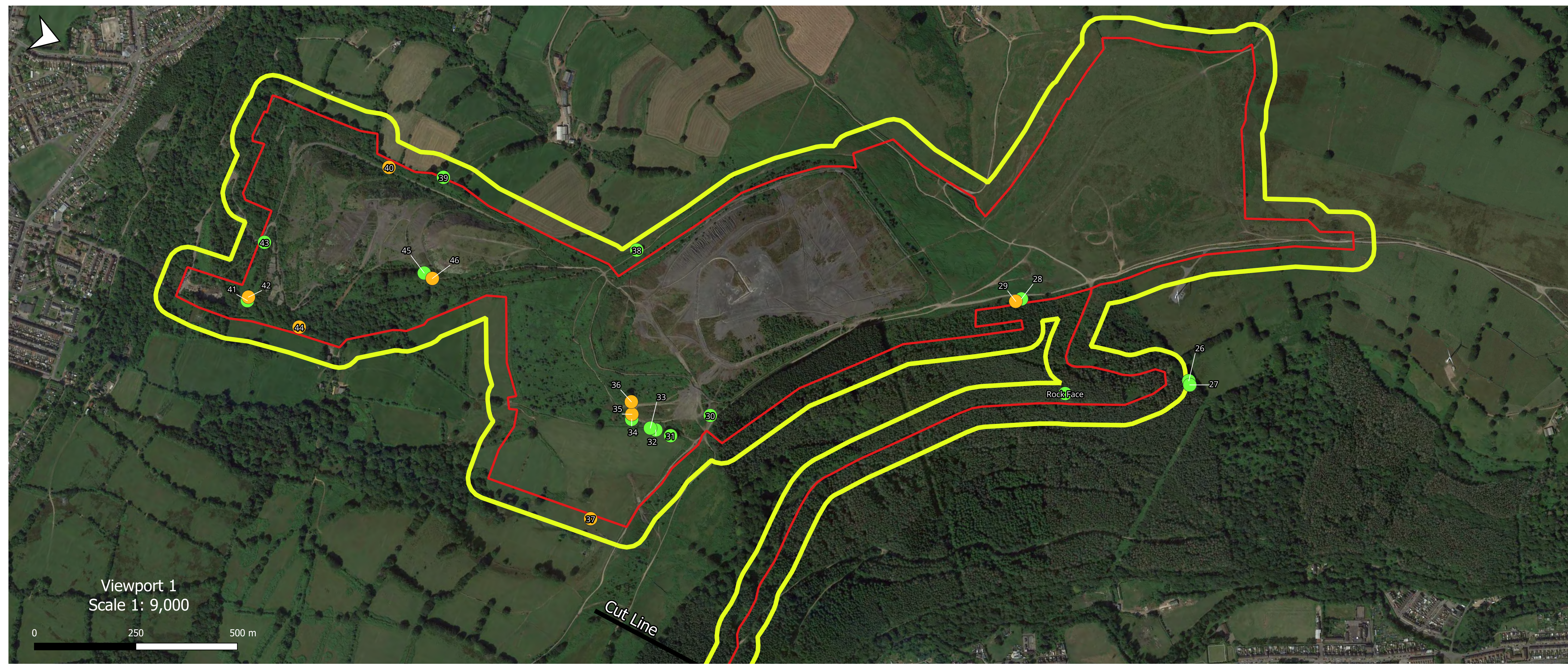


## DRAWINGS

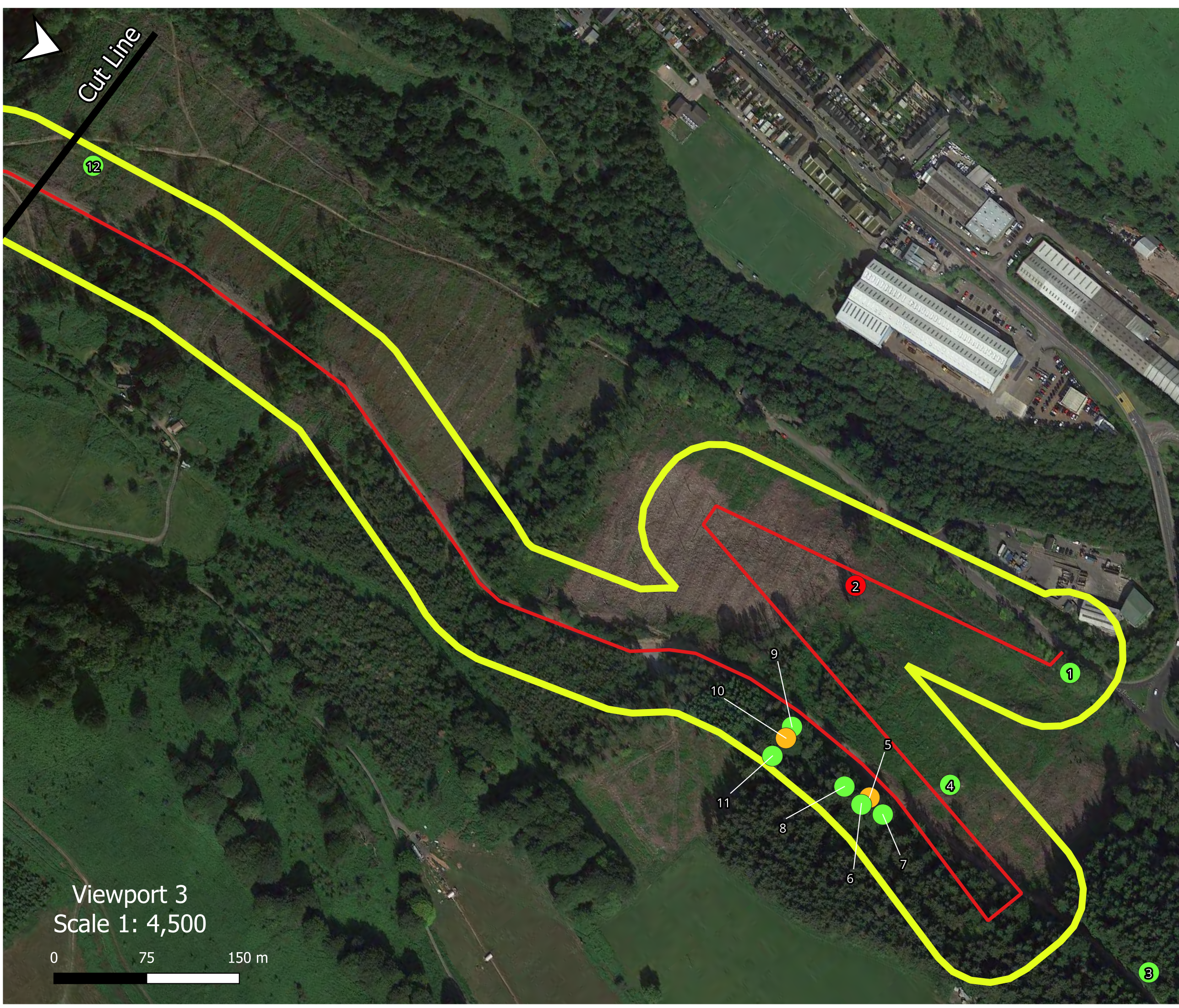
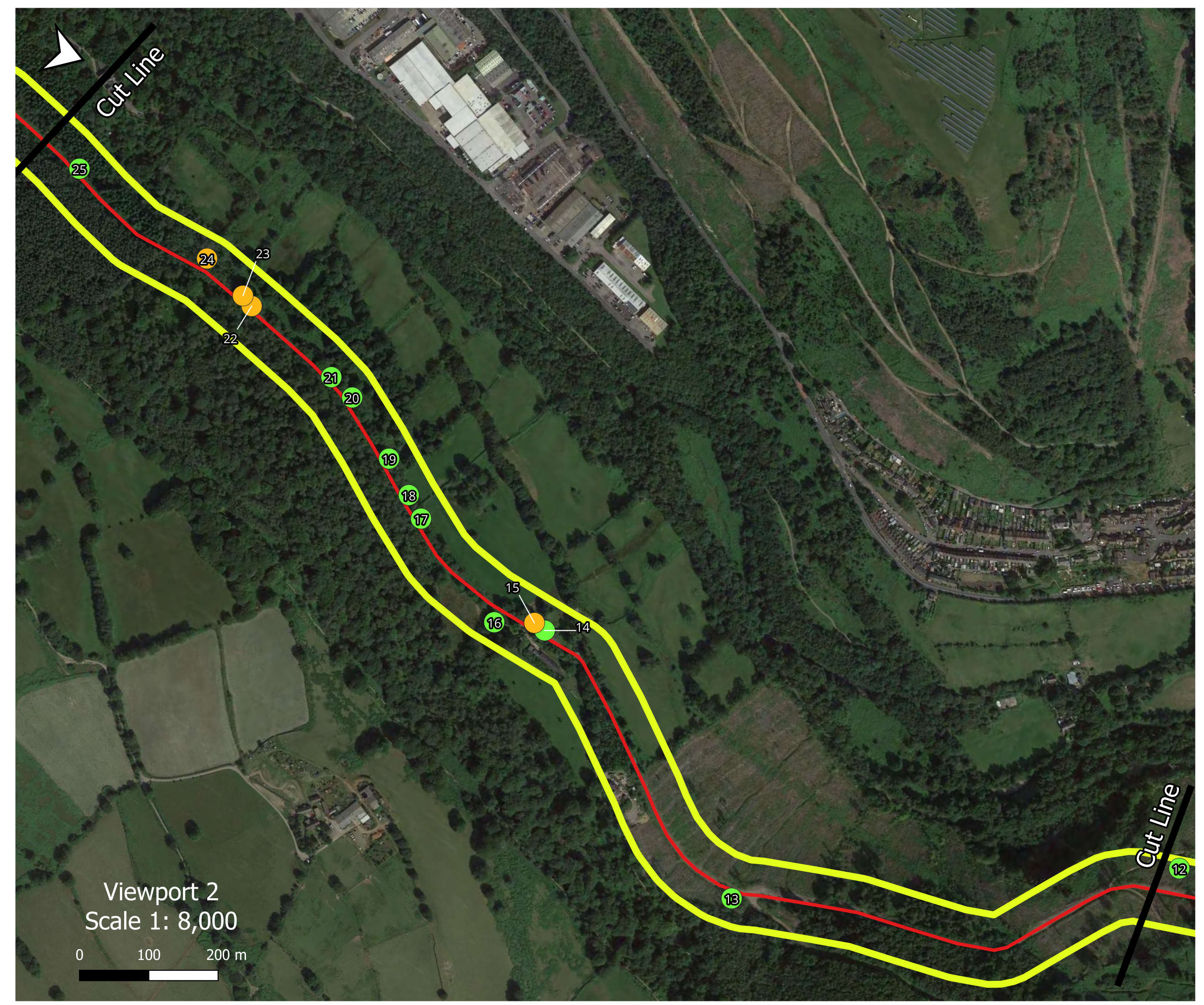
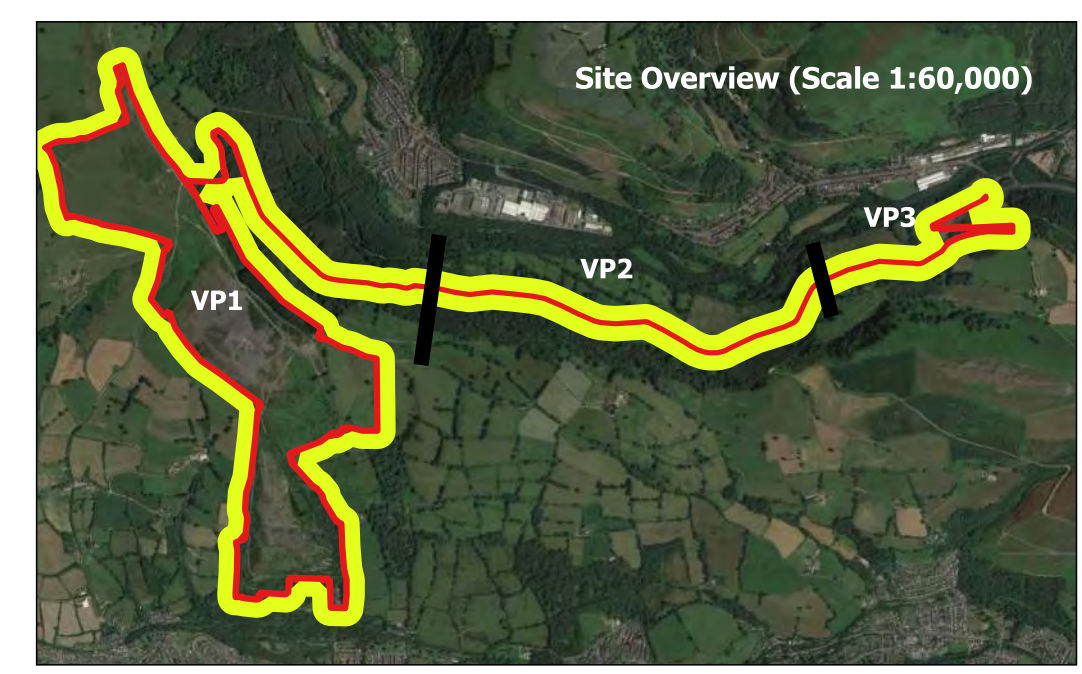
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- GC4277-WSP-74-XX-M2-L-3002 – Ground Level Tree Assessment Map





- Key:
- 50m Survey Boundary
  - Red Line Boundary
  - High
  - Moderate
  - Low



|   |              |               |        |               |            |
|---|--------------|---------------|--------|---------------|------------|
| P01                                     | NP           | MW            | RP     | First Issue.  | 06/02/2023 |
| Rev                                     | Drwn         | Chk'd         | Appr'd | Description   | Date       |
| Purpose of issue                        |              |               |        |               |            |
| <b>S2 - Issued for Information</b>      |              |               |        |               |            |
| Classification                          |              |               |        |               |            |
| <b>Confidential</b>                     |              |               |        |               |            |
| Client                                  |              |               |        |               |            |
| <b>Energy Recovery Investments</b>      |              |               |        |               |            |
| Project                                 |              |               |        |               |            |
| <b>Bedwas Tip</b>                       |              |               |        |               |            |
| Drawing Title                           |              |               |        |               |            |
| <b>Ground Level Tree Assessment Map</b> |              |               |        |               |            |
| Drawn                                   | Checked      | Approved      |        |               |            |
| NP                                      | MW           | GP            |        |               |            |
| Project No                              | Date         | Scale         | Size   |               |            |
| GC/004277                               | January 2023 | See Viewports | A1     |               |            |
| Drawing identifier                      |              |               |        | Revision: P01 |            |
| <b>GC4277-WSP-74-XX-M2-L-3002</b>       |              |               |        |               |            |

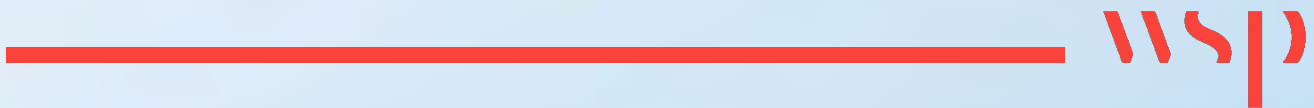


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# Appendix A

## LOCAL RECORD CENTRE BAT DATA





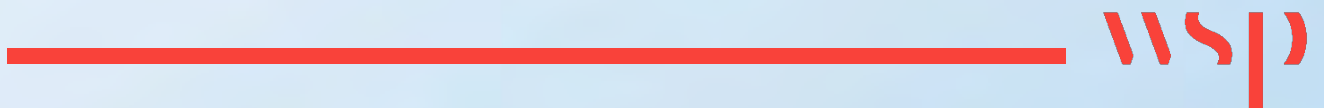


**Table A-1 – Bats within 5 km (\* = Closest Record is a roost)**

| Common Name                | Scientific Name                   | Legislation / Conservation Status                | No. of Records | Distance and Direction (Closest Record; km) | Most Recent Record |
|----------------------------|-----------------------------------|--|----------------|---|--------------------|
| Bat (unidentified species) | <i>Chiroptera</i>                 | EPS, WCA5  | 74             | 0.38 N*                                     | August 2022        |
| Brandt's bat               | <i>Myotis brandtii</i>            | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 6              | 0.43 E                                      | September 2021     |
| Brown Long-eared Bat       | <i>Plecotus auritus</i>           | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 64             | 0.43 E                                      | September 2021     |
| Common pipistrelle         | <i>Pipistrellus pipistrellus</i>  | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 216            | 0.02 N                                      | September 2022     |
| Daubenton's bat            | <i>Myotis daubentonii</i>         | EPS, HDir, WCA5, Bern, RDB2 (UK), LBAP (CLY)     | 87             | 0.43 E                                      | September 2021     |
| Greater horseshoe bat      | <i>Rhinolophus ferrumequinum</i>  | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 46             | 0.43 E                                      | July 2021          |
| Lesser horseshoe bat       | <i>Rhinolophus hipposideros</i>   | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 12             | 3.96 SE                                     | October 2021       |
| Lesser noctule             | <i>Nyctalus leisleri</i>          | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 7              | 0.43 E                                      | August 2021        |
| Long-eared Bat species     | <i>Plecotus</i>                   | EPS, HDir, WCA5, Bern                            | 9              | 0.43 E                                      | July 2021          |
| Myotis Bat species         | <i>Myotis</i>                     | EPS, HDir, WCA5, Bern                            | 17             | 0.07 E                                      | May 2020           |
| Nathusius's pipistrelle    | <i>Pipistrellus nathusii</i>      | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 39             | 0.43 E                                      | September 2021     |
| Natterer's bat             | <i>Myotis nattereri</i>           | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 3              | 0.43 E                                      | September 2021     |
| Noctule bat                | <i>Nyctalus noctula</i>           | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 89             | 0.07 E                                      | September 2021     |
| Pipistrelle Bat species    | <i>Pipistrellus</i>               | EPS, WCA5  | 54             | 0.39 N*                                     | March 2022         |
| Serotine                   | <i>Eptesicus serotinus</i>        | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 16             | 0.43 E                                      | September 2021     |
| Soprano pipistrelle        | <i>Pipistrellus pygmaeus</i>      | EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (CLY) | 120            | 0.43 E                                      | September 2021     |
| Whiskered bat              | <i>Myotis mystacinus</i>          | EPS, HDir, WCA5, Bern, RDB2 (UK)                 | 39             | 0.43 E                                      | September 2021     |
| Whiskered/Brandt's bat     | <i>Myotis mystacinus/brandtii</i> | EPS, HDir, WCA5, Bern, LBAP (CLY)                | 9              | 1.47 S                                      | June 2016          |

# Appendix B

## **GROUND LEVEL TREE ASSESSMENT RESULTS**







**Table B-1 – Ground Level Tree Assessment Full Results**

**Acronyms**

**DBH – Diameter at Breast Height**

**PRF – Potential Roost Feature**

| Tree No. | Grid Reference | Tree Species | Alive/Dead | DBH (m) | Multi-stemmed at X m | Tree height (m) | PRF Location | PRF Type    | Direction PRF Faces | Comments   | Suitability after ground assessment |
|----------|----------------|--------------|------------|---------|----------------------|-----------------|--------------|-------------|---------------------|--|-------------------------------------|
| 1        | ST 21358 91342 | Oak          | Alive      | 0.4     | -                    | 20              | Stem         | Rot-hole    | North               | -  | Low                                 |
| 2        | ST 21195 91252 | Beech        | Alive      | 1       | -                    | 30              | Stem         | Rot-hole    | Throughout          | Multiple features throughout tree. Heavy fungal growth | High                                |
| 3        | ST 21587 91240 | Silver birch | Alive      | 0.3     | 2                    | 18              | Limb         | Hazard-beam | South               | -  | Low                                 |
| 4        | ST 21368 91210 | Beech        | Dead       | 1.2     | -                    | 8               | Stem         | Other       | Throughout          | Multiple features                                      | Low                                 |
| 5        | ST 21335 91153 | Beech        | Alive      | 1       | 2                    | 15              | Stem         | Butt-rot    | East                | No evidence of bat use. Mouse nest present             | Moderate                            |
| 6        | ST 21335 91144 | Beech        | Alive      | 1.2     | -                    | 20              | Stem         | Butt-rot    | South               | Fire damaged butt                                      | Low                                 |
| 7        | ST 21352 91153 | Beech        | Alive      | 1       | -                    | 20              | Limb         | Hazard-beam | South-west          | Also 3 knot holes facing west on trunk                 | Low                                 |
| 8        | ST 21315 91143 | Oak          | Alive      | 0.2     | -                    | 10              | Stem         | Rot-hole    | South               | 3 features   | Low                                 |
| 9        | ST 21251 91140 | Oak          | Alive      | 0.3     | -                    | 15              | Stem         | Rot-hole    | South               | -  | Low                                 |
| 10       | ST 21255 91131 | Beech        | Alive      | 0.8     | -                    | 20              | Stem         | Butt-rot    | South               | -  | Moderate                            |
| 11       | ST 21260 91113 | Oak          | Alive      | 0.8     | -                    | 18              | Limb         | Knot-hole   | Throughout          | Multiple holes   | Low                                 |
| 12       | ST 20543 90986 | Beech        | Alive      | 0.7     | -                    | 20              | Stem         | Callus roll | Throughout          | Multiple features                                      | Low                                 |
| 13       | ST 20032 90589 | Alder        | Alive      | 0.3     | -                    | 12              | Limb         | Rot-hole    | North-east          | Small holes in rotted section of limb                  | Low                                 |



| Tree No. | Grid Reference | Tree Species               | Alive/ Dead | DBH (m) | Multi-stemmed at X m | Tree height (m) | PRF Location | PRF Type                         | Direction PRF Faces | Comments                             | Suitability after ground assessment |
|----------|----------------|----------------------------|-------------|---------|----------------------|-----------------|--------------|----------------------------------|---------------------|--------------------------------------|-------------------------------------|
| 14       | ST 19593 90757 | Ash                        | Alive       | 0.8     | -                    | 18              | Stem         | Ivy                              | Throughout          | Thick ivy stems                      | Low                                 |
| 15       | ST 19574 90758 | Oak                        | Alive       | 0.9     | -                    | 20              | Limb         | Hazard-beam                      | Throughout          | Several hazard beam features and rot | Moderate                            |
| 16       | ST 19526 90727 | Plane                      | Alive       | 1.1     | -                    | 25              | Stem         | Callus roll                      | East                | Also rot holes and tear outs         | Low                                 |
| 17       | ST 19354 90791 | Grey willow                | Alive       | 0.4     | -                    | 10              | Stem         | Rot-hole                         | South-east          | -                                    | Low                                 |
| 18       | ST 19321 90809 | Grey willow                | Alive       | 0.4     | -                    | 10              | Stem         | Flute                            | South               | Also knot holes                      | Low                                 |
| 19       | ST 19268 90837 | Hazel                      | Alive       | 0.2     | -                    | 8               | Limb         | Wound                            | South-west          | Two trees with features              | Low                                 |
| 20       | ST 19174 90880 | Grey willow                | Alive       | 0.3     | 6                    | 8               | Stem         | Wound                            | Throughout          | Multiple features                    | Low                                 |
| 21       | ST 19133 90887 | Grey willow & silver birch | Alive       | 0.2     | 4                    | 10              | Stem         | Wound                            | Throughout          | Multiple features                    | Low                                 |
| 22       | ST 18980 90908 | Beech                      | Alive       | 0.7     | 2                    | 30              | Stem         | Rot-hole                         | Throughout          | Multiple features                    | Moderate                            |
| 23       | ST 18961 90913 | Beech                      | Alive       | 1.5     | -                    | 40              | Stem         | Woodpecker-hole                  | South               | Multiple features                    | Moderate                            |
| 24       | ST 18888 90929 | Ash                        | Alive       | 1       | -                    | 30              | Limb         | Rot-hole                         | Throughout          | Multiple features                    | Moderate                            |
| 25       | ST 18663 90933 | Scots pine x2              | Alive       | 0.4     | -                    | 18              | Stem         | Ivy                              | Throughout          | Thick stem ivy                       | Low                                 |
| 26       | ST 17532 91782 | Beech                      | Alive       | 0.4     | 4                    | 25              | Stem         | Compression-fork / Double-leader | -                   | -                                    | Low                                 |
| 27       | ST 17541 91788 | Beech                      | Alive       | 1       | -                    | 25              | Stem         | Butt-rot                         | Throughout          |                                      | Low                                 |
| 28       | ST 17476 91328 | Beech                      | Alive       | 1.2     | -                    | 10              | Limb         | Wound                            | South               | Also fluting and stem cavities       | Low                                 |





| Tree No. | Grid Reference | Tree Species | Alive/ Dead | DBH (m)  | Multi-stemmed at X m | Tree height (m) | PRF Location | PRF Type                              | Direction PRF Faces | Comments  | Suitability after ground assessment |
|----------|----------------|--------------|-------------|----------|----------------------|-----------------|--------------|---------------------------------------|---------------------|---|-------------------------------------|
| 29       | ST 17486 91317 | Beech        | Alive       | 1        | -                    | 10              | Stem         | Butt-rot                              | South               | Cavity at top of rot area 35cm deep 20 to 30cm at widest  | Moderate                            |
| 30       | ST 17998 90700 | Goat willow  | Alive       | 0.35     | 4                    | 8               | Limb         | Hazard-beam                           | West                | 2 hazard beams  | Low                                 |
| 31       | ST 18077 90624 | Oak          | Alive       | 0.4      | -                    | 6               | Stem         | Knot-hole                             | North-east          | Hole leads to cavity 30cm deep, 15cm wide. beech mast in cavity   | Low                                 |
| 32       | ST 18075 90585 | Hawthorn     | Alive       | 4.5      | -                    | 5               | Limb         | Rot-hole                              | South               | Hole leading to cavity  | Low                                 |
| 33       | ST 18076 90571 | Hawthorn     | Alive       | 0.2      | -                    | 3               | Stem         | Subsidence / Helical / Shearing crack | -                   | -   | Low                                 |
| 34       | ST 18070 90520 | Ash          | Alive       | 0.6      | -                    | 18              | Stem         | Knot-hole                             | North-west          | 2 small knotholes   | Low                                 |
| 35       | ST 18058 90517 | Hawthorn     | Alive       | 0.4      | -                    | 5               | Stem         | Rot-hole                              | North               | Hole leads to cavity, also compression fork with roost space  | Moderate                            |
| 36       | ST 18030 90505 | Beech        | Alive       | 1.5      | 4                    | 30              | Stem         | Knot-hole                             | South-east          | Leads to cavity extending up into rotting stem  | Low                                 |
| 37       | ST 18334 90505 | Beech        | Alive       | 1.2      | -                    | 25              | Stem         | Butt-rot                              | East                |   | Moderate                            |
| 38       | ST 17672 90396 | Beech        | Alive       | 1        | -                    | 25              | Stem         | Flute                                 | East                | Cavity created by flute 25cm high, 10cm wide  | Low                                 |
| 39       | ST 17658 89889 | Beech        | Alive       | 0.6 to 1 | -                    | 20              | Limb         | Other                                 | East                | 9 mature beech, unable to access closely, precautionary low on all but few features identified through binoculars | Low                                 |
| 40       | ST 17678 89755 | Beech        | Alive       | 0.5      | -                    | 18              | Stem         | Butt-rot                              | West                | Knot hole also present. butt cavity 1 m+ into heart of tree   | Moderate                            |



| Tree No.  | Grid Reference | Tree Species | Alive/Dead | DBH (m) | Multi-stemmed at X m | Tree height (m) | PRF Location | PRF Type        | Direction PRF Faces | Comments                         | Suitability after ground assessment |
|-----------|----------------|--------------|------------|---------|----------------------|-----------------|--------------|-----------------|---------------------|----------------------------------|-------------------------------------|
| 41        | ST 18103 89533 | Oak          | Alive      | 1       | -                    | 15              | Stem         | Butt-rot        | South               | Shallow rot up into stem 30cm    | Low                                 |
| 42        | ST 18094 89533 | Oak          | Alive      | 0.7     | -                    | 15              | Stem         | Woodpecker-hole | North               | -                                | Moderate                            |
| 43        | ST 17953 89526 | Ash          | Alive      | 0.6     | -                    | 15              | Stem         | Rot-hole        | South               | Pollarded tree                   | Low                                 |
| 44        | ST 18123 89675 | Oak          | Alive      | 1       | -                    | 18              | Limb         | Woodpecker-hole | West                | -                                | Moderate                            |
| 45        | ST 17896 89921 | Beech        | Alive      | 1       | 2                    | 20              | Limb         | Knot-hole       | East                | -                                | Low                                 |
| 46        | ST 17902 89945 | Beech        | Alive      | 1       | -                    | 20              | Stem         | Butt-rot        | North-west          | -                                | Moderate                            |
| Rock face | ST 17661 91505 | -            | -          | -       | -                    | -               | -            | -               | East                | Rock face with multiple cavities | Low                                 |





Quest House, St Mellons Business Park,  
Unit 2 Quest, Fortran Road  
St Mellons, Cardiff  
CF3 0EY

# V3-S09/0003

## **BAT STATIC SURVEY REPORT**





# TECHNICAL NOTE

|                 |                                     |                         |                                     |
|-----------------|-------------------------------------|-------------------------|-------------------------------------|
| <b>DATE:</b>    | 13 December 2023                    | <b>CONFIDENTIALITY:</b> | Confidential                        |
| <b>SUBJECT:</b> | Bat Static Surveys                  | <b>DOC REF:</b>         | GC4277-WSP-74-XX-RP-L-0008          |
| <b>PROJECT:</b> | Bedwas Tips                         | <b>AUTHOR:</b>          | Megan Watts (Ecologist)             |
| <b>CHECKED:</b> | Richard Poole (Principal Ecologist) | <b>APPROVED:</b>        | Geraint Pitman (Associate Director) |

## INTRODUCTION

WSP was commissioned by Energy Recovery Investments Ltd to undertake bat activity assessments at Bedwas Tips (approximate Central Grid Reference: ST 17668 90526) to identify the composition of species using the site and identify possible constraints relating to bats from the proposed development.

The main site is located within 1 km of Bedwas, Caerphilly County Borough Council (CCBC), and covers a large area including two existing coal tips and a haul road route.

Figure 1 shows the full site area, this report is concentrated on the eastern extent of the haul road due to the extent of works required within this section to connect the haul road to the A467.

**Figure 1:** Location of proposed works highlighted in red.





# TECHNICAL NOTE

|                 |                                     |                         |                                     |
|-----------------|-------------------------------------|-------------------------|-------------------------------------|
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| <b>CHECKED:</b> | Richard Poole (Principal Ecologist) | <b>APPROVED:</b>        | Geraint Pitman (Associate Director) |

## METHODOLOGY

### Static Deployment

Six static bat detectors were deployed at discrete locations across the eastern extent of the proposed haul road route. Detectors were deployed for seven consecutive nights between April and August inclusive. Detectors deployed were Anabat swift models to allow full spectrum sonograms to be captured. Detectors were deployed randomly each month so that variations in the operation of individual detectors wouldn't adversely affect or influence the data recorded.

Bat detector locations were chosen to provide a sample of bat activity from each habitat present within the study area and to identify bat foraging areas, commuting routes, and possible bat crossing points over the proposed haul road. Data was recorded from half an hour before sunset to half an hour after sunrise, the period during which bats are usually active and away from their roosts. The duration of recording per night varied throughout the survey period according to the duration of day/night length. The bat detector sound files were then analysed using Anabat Insight software to assess the level of bat activity at each location.

Grid references of each static detector location are provided in Table 1 below and can be viewed in Drawing GC4277-WSP-74-XX-M2-L-3005 - Bat Static Locations.

**Table 1:** Static detector locations.

| Location | NGR            | Identifying Features/Notes   |
|----------|----------------|--|
| 1        | ST 21314 91328 | Trunk of oak tree ( <i>Quercus</i> sp.) near entrance to Sirhowy Country Park facing south.                    |
| 2        | ST 21481 91314 | Trunk of oak tree near to disused quarry south of A467 roundabout facing east.                                 |
| 3        | ST 21487 91285 | Trunk of pine tree ( <i>Pinus</i> sp.) at the north-west corner of plantation woodland facing west.            |
| 4        | ST 21486 91255 | Trunk of pine tree in plantation woodland facing south.  |
| 5        | ST 21502 91224 | Trunk of pine tree at the south-west corner of plantation woodland facing south.                               |
| 6        | ST 21329 91154 | Trunk of beech ( <i>Fagus sylvatica</i> ) within patch of beech trees in the plantation woodland facing south. |





## TECHNICAL NOTE

|                 |                                     |                         |                                     |
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| <b>PROJECT:</b> | Bedwas Tips                         | <b>AUTHOR:</b>          | Megan Watts (Ecologist)             |
| <b>CHECKED:</b> | Richard Poole (Principal Ecologist) | <b>APPROVED:</b>        | Geraint Pitman (Associate Director) |

### Analysis of Bat Echolocation Data

Full spectrum sound files from Anabat Swifts were analysed in Anabat Insight using the Bat-Classify Auto ID program. 10% of data was manually checked for files identified as common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), or noise. Where bat species were being consistently identified within noise files for a night, the noise checks were increased until no further bats were detected. 100% of the data was manually checked for all the other bat species. Bat species which are rarer or have more complex calls, or any calls which could not be identified, were referred by the first checker to a bat licensed ecologist. Validating the data through manual checks follows the Bat Conservation Trust (BCT) best practice guidelines (Collins, J. (Ed) 2016).

Bats from the *Myotis* genus of bats produce frequency modulated calls with overlapping call parameters and cannot be reliably distinguished to species level on call alone. As such, *Myotis* calls were identified as *Myotis* sp. if undetermined. Bats of the *Nyctalus* genus (noctule (*Nyctalus noctula*), Leisler's (*Nyctalus leisleri*), and serotine (*Eptesicus serotinus*) can produce calls with overlapping call parameters. Where it was not possible to separate these calls, they were either grouped as *Nyctalus* sp. (noctule or Leisler's) or *Nyctaloid* (noctule, Leisler's or serotine).

The initial check of sound files was carried out by Megan Watts (Ecologist) and rarer species and queries was checked by NRW bat licence holder Richard Poole (Principal Ecologist).

Table 2 is a key to the abbreviated species names used throughout the report. Tables 3 - 8 show the number of passes of different bat species the static recorded throughout the five-month survey period' rather than repeat this in each of the static introductions.

# TECHNICAL NOTE

|                 |                                     |                         |                                     |
|-----------------|-------------------------------------|-------------------------|-------------------------------------|
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| <b>PROJECT:</b> | Bedwas Tips                         | <b>AUTHOR:</b>          | Megan Watts (Ecologist)             |
| <b>CHECKED:</b> | Richard Poole (Principal Ecologist) | <b>APPROVED:</b>        | Geraint Pitman (Associate Director) |

**Table 2:** Key to abbreviated species names.

| Abbreviation  | Full species name  |
|---------------|--|
| <b>Ppip</b>   | Common pipistrelle ( <i>Pipistrellus pipistrellus</i> )  |
| <b>Ppyg</b>   | Soprano pipistrelle ( <i>Pipistrellus pygmaeus</i> )   |
| <b>PipSp</b>  | Pipistrelle species ( <i>Pipistrellus</i> )  |
| <b>Myotis</b> | Myotis species ( <i>Myotis</i> )   |
| <b>Paur</b>   | Brown long-eared bat ( <i>Plecotus auritus</i> )   |
| <b>NSL</b>    | Noctule bat ( <i>Nyctalus noctule</i> ), Serotine bat ( <i>Eptesicus serotinus</i> ), Leisler's bat ( <i>Nyctalus leisleri</i> ) |
| <b>Rhip</b>   | Lesser horseshoe bat ( <i>Rhinolophus hipposideros</i> )   |
| <b>Rfer</b>   | Greater horseshoe bat ( <i>Rhinolophus ferrumequinum</i> )   |

## Bat Activity Index

To ensure that results from each static detector location was comparable the data was transformed to the number of bat passes per hour, for use as a Bat Activity Index (BAI), using the following equation:

$$\text{Bat Activity Index} = \frac{\text{Total bat passes recorded at a location}}{\text{Total number of hours the detector was recording}}$$

This data transformation allows adjustment for the differences in the hours of recording due to detector failures or varying dates of deployment as well as the variations in night length throughout the year.





## TECHNICAL NOTE

|                 |                                     |                         |                                     |
|-----------------|-------------------------------------|-------------------------|-------------------------------------|
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| <b>SUBJECT:</b> | Bat Static Surveys                  | <b>DOC REF:</b>         | GC4277-WSP-74-XX-RP-L-0008          |
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| <b>CHECKED:</b> | Richard Poole (Principal Ecologist) | <b>APPROVED:</b>        | Geraint Pitman (Associate Director) |

## LIMITATIONS

### Collection and analysis of acoustic data

Each bat species differs in its likelihood of detectability, repetition rate and call intensity. Additionally, there is also variation in the sensitivity of different models of bat detectors to different bat calls and this variation should ideally be considered when using particular bat detectors. For example, bats with calls at a low frequency and/or high amplitude, such as noctule bats, can be detected over greater distances whereas species such as brown long-eared (*Plecotus auritus*) bat and barbastelle (*Barbastella barbastellus*) that use low amplitude calls, or horseshoe (*Rhinolophus* sp.) bats that use high frequency calls are more difficult to detect. *Myotis* species calls often overlap depending on the type of habitat they are recorded in. This makes it difficult to identify *Myotis* bats to species level; therefore, often they are recorded as '*Myotis species*'.

The automated passive detectors are powered by batteries and occasionally the battery charge depleted before a full survey period ended. Therefore, less than seven nights of data would be captured should batteries fail. (e.g., Static 1, August 2023). However, activity is analysed per night, rather than averaged over seven nights, and therefore this is not considered to be a significant limitation.

The detectors will not provide a count of individual bats passing through the survey area as each bat pass recorded may refer either to different individuals or to one or more bats passing the bat detector repeatedly. If more than one bat is recorded simultaneously a minimum count would be applied to that sound file alone. However, passive detector data can be used to make a cautious assessment of the likely type and levels of bat activity.

### General limitations

Any ecological survey can only identify what was present on site at the time it was conducted, and habitat use by species can change over time. The length of time survey data remains valid will depend on a case-by-case basis, but it is generally considered that if proposed works do not commence within 2 years of the date of this report an update may be required.

# TECHNICAL NOTE

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| <b>PROJECT:</b> | Bedwas Tips                         | <b>AUTHOR:</b>          | Megan Watts (Ecologist)             |
| <b>CHECKED:</b> | Richard Poole (Principal Ecologist) | <b>APPROVED:</b>        | Geraint Pitman (Associate Director) |

## RESULTS

### Static 1

Located on an oak tree on the road to the entrance of Sirhowy Country Park facing south towards the scrub and grassland habitat where the proposed haul road will exit to the road. Table 3 shows the number of passes of different bat species the static recorded throughout the five-month survey period.

**Table 3:** Total bat passes per species – Static 1

| Date                      | Ppip  | Ppyg | PipSp | Myotis | Paur | NSL  | Rhip | Rfer |
|---------------------------|-------|------|-------|--------|------|------|------|------|
| April 2023                | 555   | 73   | 2     | 12     | 5    | 1    | 0    | 0    |
| May 2023                  | 3659  | 313  | 0     | 7      | 1    | 93   | 0    | 0    |
| June 2023                 | 2074  | 375  | 0     | 22     | 10   | 7    | 1    | 3    |
| July 2023                 | 1197  | 139  | 0     | 9      | 1    | 3    | 0    | 0    |
| August 2023               | 1184  | 331  | 0     | 15     | 0    | 142  | 0    | 0    |
| <b>Total</b>              | 8666  | 1231 | 2     | 65     | 17   | 246  | 1    | 3    |
| <b>Bat Activity Index</b> | 29.23 | 1.15 | 0.01  | 0.22   | 0.06 | 0.82 | 0.00 | 0.01 |

### Static 2

Located on an oak tree on the adjacent to the quarry south of the A467 roundabout with the static facing east towards the quarry. Table 4 shows the number of passes of different bat species the static had throughout the five-month survey period.

**Table 4:** Total bat passes per species – Static 2

| Date       | Ppip | Ppyg | PipSp | Myotis | Paur | NSL | Rhip | Rfer |
|------------|------|------|-------|--------|------|-----|------|------|
| April 2023 | 1204 | 138  | 0     | 8      | 51   | 0   | 1    | 0    |
| May 2023   | 1599 | 38   | 0     | 1      | 0    | 15  | 1    | 2    |



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| Date                      | Ppip  | Ppyg | PipSp | Myotis | Paur | NSL  | Rhip | Rfer |
|---------------------------|-------|------|-------|--------|------|------|------|------|
| <b>June 2023</b>          | 314   | 31   | 0     | 43     | 1    | 9    | 1    | 2    |
| <b>July 2023</b>          | 482   | 35   | 0     | 5      | 0    | 1    | 0    | 0    |
| <b>August 2023</b>        | 1935  | 306  | 0     | 3      | 10   | 34   | 0    | 0    |
| <b>Total</b>              | 5534  | 548  | 0     | 60     | 62   | 59   | 3    | 4    |
| <b>Bat Activity Index</b> | 17.31 | 1.71 | 0     | 0.19   | 0.19 | 0.18 | 0.01 | 0.01 |

### Static 3

Located on a pine tree located on the north-western corner of the plantation woodland facing west towards the scrub and grassland habitat. Table 5 shows the number of passes of different bat species the static had throughout the five-month survey period.

**Table 5:** Total bat passes per species – Static 3

| Date                      | Ppip | Ppyg | PipSp | Myotis | Paur | NSL  | Rhip | Rfer |
|---------------------------|------|------|-------|--------|------|------|------|------|
| <b>April 2023</b>         | 348  | 21   | 0     | 1      | 10   | 0    | 0    | 0    |
| <b>May 2023</b>           | 928  | 20   | 0     | 2      | 1    | 11   | 0    | 0    |
| <b>June 2023</b>          | 527  | 25   | 0     | 7      | 1    | 3    | 0    | 0    |
| <b>July 2023</b>          | 204  | 28   | 0     | 1      | 0    | 1    | 0    | 0    |
| <b>August 2023</b>        | 202  | 22   | 0     | 7      | 0    | 23   | 0    | 0    |
| <b>Total</b>              | 2209 | 116  | 0     | 18     | 12   | 38   | 0    | 0    |
| <b>Bat Activity Index</b> | 6.95 | 0.37 | 0     | 0.06   | 0.04 | 0.12 | 0    | 0    |

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## Static 4

Located on a pine tree within the plantation woodland facing south. Table 6 shows the number of passes of different bat species the static had throughout the five-month survey period.

**Table 6:** Total bat passes per species – Static 4

| Date                      | Ppip | Ppyg | PipSp | Myotis | Paur | NSL  | Rhip | Rfer |
|---------------------------|------|------|-------|--------|------|------|------|------|
| April 2023                | 8    | 1    | 0     | 2      | 0    | 0    | 0    | 0    |
| May 2023                  | 889  | 47   | 0     | 10     | 1    | 23   | 0    | 2    |
| June 2023                 | 262  | 26   | 0     | 3      | 0    | 6    | 0    | 0    |
| July 2023                 | 340  | 108  | 0     | 6      | 0    | 6    | 0    | 0    |
| August 2023               | 613  | 30   | 0     | 4      | 7    | 34   | 0    | 0    |
| <b>Total</b>              | 2112 | 212  | 0     | 25     | 8    | 69   | 0    | 2    |
| <b>Bat Activity Index</b> | 6.68 | 0.67 | 0     | 0.08   | 0.03 | 0.22 | 0    | 0.01 |

## Static 5

Located on a pine tree on the south-western corner of the plantation woodland facing south towards the haul road. Table 7 shows the number of passes of different bat species the static had throughout the five-month survey period.

**Table 7:** Total bat passes per species – Static 5

| Date       | Ppip | Ppyg | PipSp | Myotis | Paur | NSL | Rhip | Rfer |
|------------|------|------|-------|--------|------|-----|------|------|
| April 2023 | 408  | 79   | 0     | 15     | 13   | 0   | 0    | 3    |
| May 2023   | 693  | 19   | 0     | 2      | 1    | 15  | 0    | 2    |
| June 2023  | 1562 | 62   | 0     | 8      | 4    | 6   | 0    | 1    |
| July 2023  | 1468 | 181  | 0     | 17     | 4    | 0   | 0    | 0    |



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| Date                      | Ppip  | Ppyg | PipSp | Myotis | Paur | NSL  | Rhip | Rfer |
|---------------------------|-------|------|-------|--------|------|------|------|------|
| <b>August 2023</b>        | 2123  | 46   | 0     | 6      | 3    | 20   | 0    | 0    |
| <b>Total</b>              | 6254  | 387  | 0     | 48     | 25   | 41   | 0    | 6    |
| <b>Bat Activity Index</b> | 19.78 | 1.22 | 0     | 0.15   | 0.08 | 0.13 | 0    | 0.02 |

## Static 6

Located on a beech tree within a patch of beeches located within the plantation woodland south of the haul road route facing south. Table 8 shows the number of passes of different bat species the static had throughout the five-month survey period.

**Table 8:** Total bat passes per species – Static 6

| Date                      | Ppip | Ppyg | PipSp | Myotis | Paur | NSL  | Rhip | Rfer |
|---------------------------|------|------|-------|--------|------|------|------|------|
| <b>April 2023</b>         | 0    | 0    | 0     | 0      | 0    | 0    | 0    | 0    |
| <b>May 2023</b>           | 19   | 1    | 0     | 0      | 0    | 0    | 0    | 0    |
| <b>June 2023</b>          | 17   | 25   | 0     | 4      | 0    | 2    | 0    | 0    |
| <b>July 2023</b>          | 2296 | 107  | 0     | 753    | 0    | 2    | 0    | 0    |
| <b>August 2023</b>        | 33   | 2    | 0     | 3      | 0    | 4    | 0    | 0    |
| <b>Total</b>              | 2365 | 135  | 0     | 760    | 0    | 8    | 0    | 0    |
| <b>Bat Activity Index</b> | 7.63 | 0.44 | 0     | 2.45   | 0    | 0.03 | 0    | 0    |

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## BAT ACTIVITY

Static detectors recorded 31351 bat passes during their deployment between April 2023 and August 2023. A total of ten species confirmed and these were:

- Common pipistrelle;
- Soprano pipistrelle;
- Daubenton’s bat;
- Whiskered/Brandt’s bat;
- Noctule;
- Serotine;
- Leisler’s bat;
- Brown long-eared;
- Greater horseshoe; and
- Lesser horseshoe.

The Bat Activity Index (BAI) for each species or species group at each of the static locations is shown in Table 9 below.

**Table 9:** Bat Activity Index (BAI) for Statics 1 – 6 showing static locations with the highest bat activity index for each species recorded highlighted in green. BAI recorded to 2 decimal places.

| Location | Ppip  | Ppyg | Pip sp | Myotis | Paur | NSL  | Rhip | Rfer |
|----------|-------|------|--------|--------|------|------|------|------|
| 1        | 29.23 | 4.15 | 0.01   | 0.22   | 0.06 | 0.83 | 0.00 | 0.01 |
| 2        | 17.31 | 1.31 | 0      | 0.19   | 0.19 | 0.18 | 0.01 | 0.01 |
| 3        | 6.95  | 0.36 | 0      | 0.06   | 0.04 | 0.12 | 0    | 0    |
| 4        | 6.68  | 0.67 | 0      | 0.08   | 0.03 | 0.22 | 0    | 0.01 |
| 5        | 19.78 | 1.22 | 0      | 0.15   | 0.08 | 0.13 | 0    | 0.02 |
| 6        | 7.63  | 0.44 | 0      | 2.45   | 0    | 0.03 | 0    | 0    |





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### Greater Horseshoe Bats

Greater horseshoe bats were recorded on Statics 1, 2, 4 and 5. A total of 15 passes were recorded over the survey period.

Static 5 saw the highest BAI for greater horseshoe with 0.02 (6 passes over 316.22 hours). The night with the most passes was 15<sup>th</sup> April 2023, with three passes in one night (Static 5).

### Lesser Horseshoe Bats

Lesser horseshoe bats were recorded on Statics 1 and 2. A total of 4 passes were recorded over the survey period.

Static 2 saw the highest BAI for lesser horseshoe with 0.01 (3 passes over 319.75 hours). No more than one pass per night was recorded at any of the static locations.

### Pipistrelle Bats

Both common and soprano pipistrelle bats were recorded at all the static locations. A total of 27,140 passes of common pipistrelle was recorded over the survey period and 2,629 passes of soprano pipistrelle was recorded.

Static 1 saw the highest BAI for both common and soprano pipistrelle with 29.23 and 4.15 respectively (8,666 common pipistrelle passes and 1,231 soprano pipistrelle passes over 296.45 hours).

### Myotis Bat Species

Myotis bats were recorded at all static locations, but in far fewer numbers than pipistrelles. The highest BAI was recorded at Static 6 with 2.45 (760 passes over 309.80 hours).

Due to the difficulty in accurately separating *Myotis* species by calls, all species have been recorded as '*Myotis* sp.'. Use of the 'Bat Classify' auto identification software during the initial processing of static data, however, resulted in some *Myotis* bats being identified to species level (with an 85% confidence limit) and these included Daubenton's and whiskered/Brandt's bat.

### Brown Long-Eared Bats

Brown long-eared bats were recorded in most static locations with the exception of Static 6 where no passes were recorded.

The highest BAI was at Static 2 with 0.19 (62 passes over 319.75 hours).



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### Noctule / Serotine & Leisler's Bats

Noctule, serotine and Leisler's bats were recorded at all static locations with the highest BAI being recorded at Static 1 with 0.83 (246 passes over 296.45 hours).

Due to the difficulty in separating noctule, serotine and Leisler's calls, all species have been generalised in static data tables as 'NSL.'

## OVERALL VALUE OF THE SITE FOR BATS

The importance of the survey area for commuting and foraging bats has been assessed using the approach described by Wray et al., 2010, shown in Appendix A.

The rarest species identified during the static data were greater horseshoe, whiskered/Brandt's bat, noctule and serotine. A score of **20** is therefore applied.

From the survey results, it is considered that due to the relatively low BAI scores that the rarest bat species were in low numbers and therefore a score of **10** is applied.

The SSSI Castle and Coed Craig Ruperra, designated for greater horseshoes, is located approximately 4.3 km from the site. Although the distance is relatively small, the two sites are separated by a valley with little connecting habitat and therefore the site is unlikely to be used by greater horseshoe bats from the SSSI. Therefore, the roosts/potential roosts nearby score is rated 'not known' and given a score of **4**.

The landscape in the vicinity of the survey area includes plantation woodland, large mosaic habitat, agricultural land and an industrial site. Therefore, for commuting routes a score of **3** is applied, and for foraging areas a score of **4** is applied.

The overall score for commuting routes for the site is  $20 + 10 + 4 + 3 = 37$ .

The overall score for foraging areas for the site is  $20 + 10 + 4 + 4 = 38$ .

The site is therefore considered as of **Regional Value** for commuting and foraging bats.





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## EVALUATION OF IMPACTS

### Short Term Impacts: Disturbance

The proposed works may cause short term disturbance to foraging and commuting bats during the site preparation and construction phases particularly surrounding the construction of the link between the haul road and highway.

### Long Term Impacts: Roost Destruction, Loss or Modification and Isolation of Foraging Habitat

No long-term impacts are anticipated regarding potential roost features, as no buildings or trees on site suitable for roosting bats are being impacted.

The construction of the haul road connecting the current forestry road with the A467 is not expected to cause long-term negative impacts for bats due to the relatively small area of foraging habitat likely to be lost.

Although site operations on the main tip area are expected to be undertaken in both day and night-time, the haul road is only expected to be operational during daytime. Due to the habitat on the main tip site being less favourable for bats, night-time working within the main tip site is not expected to negatively impact foraging and commuting bats.

### Maintaining Favourable Status For Bats

The majority of bat species recorded were common and soprano pipistrelles, which are the most common species present within Wales with a population with an estimated combined total of 775,000 individuals (297,000 common pipistrelle and 478,000 soprano pipistrelle; Mathews et al., 2018).

No roosts are being impacted by the proposed works and as such there is unlikely to be any impact on breeding populations.



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## RECOMMENDATIONS

### Mitigation

Standard bat mitigation should be followed during construction as follows:

- Habitats around the haul road should be retained as far as possible and damage to habitats should be avoided where possible. Where it is necessary to clear vegetation near the haul road, this work should be carried out during winter months to minimise impacts upon foraging bats and maintain habitat connectivity.
- Construction and operational works of the haul road should be carried out during daylight hours; commencing 1-hour post sunrise and 1-hour pre-sunset, to reduce disturbance to bats utilising the site area for commuting and foraging. If night-time working is unavoidable then artificial construction lighting is to be kept to a minimum and should be directional and positioned to prevent excessive light spill from the construction area onto the surrounding habitat. Advice should be sought from a suitably qualified ecologist.
- All site operatives should receive a toolbox talk from a suitably experienced ecologist prior to commencement of works. This should outline any constraints relating to bats and other affected species and cover actions to be taken in the event of unexpectedly discovering any bats or roosts.

### Monitoring

Further static surveys are recommended to assess the impact of the route following completion. Bat activity surveys should be undertaken in years 1 and 3 after completion to assess the impact of the development upon foraging and commuting bats, and to allow a comparison of bat activity levels and species composition with pre-construction data. Three weeks of static surveys in years 1 and 3 post-construction, with static detectors located in the same positions as in previous surveys to be undertaken in June, July and August would provide sufficient data to allow a comparison of bat activity and determine the impact of the development on bats.

### Enhancement Opportunities

**Bat boxes** - Three 'summer roost' crevice bat boxes are recommended to be installed within the Sirhowy Country Park under guidance of an ecologist. These should be erected on trees and each box positioned facing north, south-east and south-west to give a range of temperatures throughout the season. Recommended make and model: Treble or Double Crevice; NHBS reference #187784/ #187782; available at: <https://www.nhbs.com/improved-crevice-bat-box>.



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## REFERENCES

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

Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. HMSO.

Dietz, C. von Helversen, O. & Nill, D. (2009) *Bats of Britain, Europe and Northwest Africa*. London: A & C Black Publishing.

Environment (Wales) Act 2016. HMSO

Institution of Lighting Professionals (ILP; 2023) Bats and Artificial Lighting at Night. Guidance Note 08/23.

MAGIC (2018). Multi-Agency Geographic Information System.

Matthews F, Kubasiewicz LM, Gurnell J, Harrower CA, McDonald RA, Shore RF. (2018) *A review of the Population and Conservation Status of British Mammals. A report by the Mammal society under contract to Natural England, Natural resources Wales and Scottish Natural Heritage*. Natural England, Peterborough. ISBN 978-1-78354-494-3.

Middleton, N., Froud, A., and French, K. (2014). *Social Calls of the Bats of Britain and Ireland*. Exeter: Pelagic Publishing.

Mitchell-Jones, A.J. and McLeish, A.P., (2004). *The Bat Worker's Manual, 3rd Edition*, Joint Nature Conservation Committee.

West Wales Biodiversity Information Centre (WWBIC; 2022) Ammanford LC 2 km search.

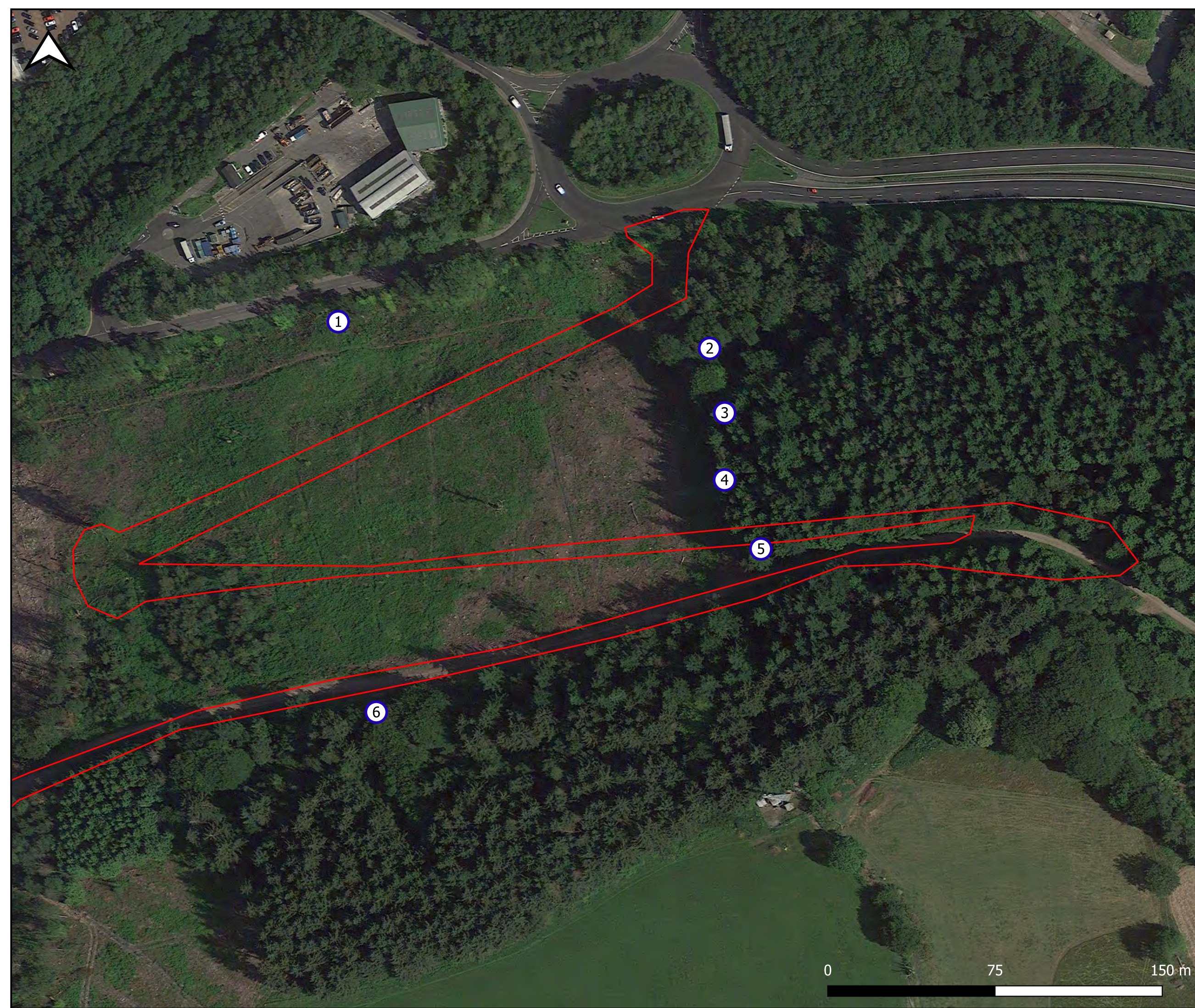
Wildlife and Countryside Act 1981 (as amended). HMSO.

Wray, S., Wells, D., Long, E., Mitchell-Jones, T. (2010) *Valuing Bats in Ecological Impact Assessment*. In Practice No 70, Dec 2010. ISSN 1754-4882, pages 23 – 25.



Reason, P.F. and Wray, S. (2023) UK Bat Mitigation Guidelines: A guide to impact, assessment, mitigation and compensation for developments affecting bats. Chartered Institute of Ecology and Environmental Management, Ampfield.

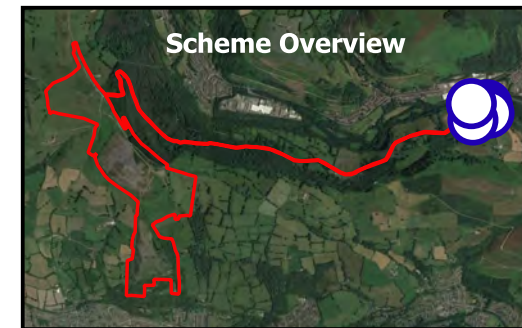
Russ, J. (2012). *British Bat Calls, A Guide to Species Identification*. Exeter: Pelagic Publishing. ISBN 978-1-907807-25-1.





Key:

-  Static locations
-  Redline Boundary



|     |      |       |        |              |          |
|-----|------|-------|--------|--------------|----------|
| P01 | NP   | MW    | GP     | First Issue. | 13/12/23 |
| Rev | Drwn | Chk'd | Appr'd | Description  | Date     |

Purpose of issue  
S2 - Suitable for Information

Classification  
Confidential

Client  
Energy Recovery Investments Ltd

Project  
Bedwas Tips

Drawing Title  
Bat Static Locations

|             |               |                |      |  |
|-------------|---------------|----------------|------|--|
| Drawn<br>NP | Checked<br>MW | Approved<br>GP |      |  |
| Project No  | Date          | Scale          | Size |  |
| GC/004277   | May 2023      | 1:3,000        | A3   |  |

Drawing identifier  
GC4277-WSP-74-XX-M2-L-3005

Revision: P01



Quest House, St Mellons Business Park, Fortran Rd, St. Mellons, Cardiff, CF3 0EY



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| <b>SUBJECT:</b> | Bat Static Surveys                  | <b>DOC REF:</b>         | GC4277-WSP-74-XX-RP-L-0008          |
| <b>PROJECT:</b> | Bedwas Tips                         | <b>AUTHOR:</b>          | Megan Watts (Ecologist)             |
| <b>CHECKED:</b> | Richard Poole (Principal Ecologist) | <b>APPROVED:</b>        | Geraint Pitman (Associate Director) |

## APPENDICES

### Appendix A- Legislation

Bats (and their habitat) are protected under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Under this legislation it is an offence to:

deliberately capture, kill or injure a bat;

- deliberately disturb wild bats (disturbance is defined as any activity likely to impair the ability to breed, reproduce, rear or nurture young, hibernate, migrate and/or significantly affect the local distribution or abundance of the species);
- damage or destroy a breeding site or resting place (i.e., roost); and
- possess, control, transport, sell, exchange, offer for sale or exchange, any live or dead animal or part of an animal.

Bats are also partially protected under the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally or recklessly:

- damage or destroy any structure or place which bats use for shelter or protection;
- disturb bats while occupying a structure or place which is used for shelter or protection; and
- obstruct access to any structure or place which bats use for shelter or protection.

Noctule bat (*Nyctalus noctula*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) bats, brown long-eared bat (*Plecotus auritus*) are also listed on Section 7 of the Environment (Wales) Act 2016 as species of principal importance for maintaining and enhancing biodiversity in Wales. Additionally, under Section 6 of the Act, public authorities (including Welsh Government) must “seek to maintain and enhance biodiversity” and to “promote the resilience of ecosystems”.

# TECHNICAL NOTE

|                 |                                     |                         |                                     |
|-----------------|-------------------------------------|-------------------------|-------------------------------------|
| <b>DATE:</b>    | 13 December 2023                    | <b>CONFIDENTIALITY:</b> | Confidential                        |
| <b>SUBJECT:</b> | Bat Static Surveys                  | <b>DOC REF:</b>         | GC4277-WSP-74-XX-RP-L-0008          |
| <b>PROJECT:</b> | Bedwas Tips                         | <b>AUTHOR:</b>          | Megan Watts (Ecologist)             |
| <b>CHECKED:</b> | Richard Poole (Principal Ecologist) | <b>APPROVED:</b>        | Geraint Pitman (Associate Director) |

## Appendix A

Table A-1 – Categorising bats by distribution and rarity

| Rarity within range                        | England  | Wales  |
|--|--|--|
| <b>Rarest (population under 10,000)</b>    | greater horseshoe<br>Bechstein's<br>alcatheo<br>greater mouse-eared<br>barbastelle<br>grey long-eared bat                            | greater horseshoe<br>whiskered<br>Brandt's<br>Bechstein's<br>alcatheo?<br>noctule<br>Nathusius' pipistrelle<br>serotine<br>barbastelle |
| <b>Rarer (population 10,000 – 100,000)</b> | lesser horseshoe<br>whiskered<br>Brandt's<br>Daubenton's<br>Natterer's<br>Leisler's<br>noctule<br>Nathusius' pipistrelle<br>serotine | lesser horseshoe<br>Daubenton's<br>Natterer's<br>brown long-eared  |
| <b>Common (population over 100,000)</b>    | common pipistrelle<br>soprano pipistrelle<br>brown long-eared  | common pipistrelle<br>soprano pipistrelle  |



# TECHNICAL NOTE

|                 |                                     |                         |                                     |
|-----------------|-------------------------------------|-------------------------|-------------------------------------|
| <b>DATE:</b>    | 13 December 2023                    | <b>CONFIDENTIALITY:</b> | Confidential                        |
| <b>SUBJECT:</b> | Bat Static Surveys                  | <b>DOC REF:</b>         | GC4277-WSP-74-XX-RP-L-0008          |
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| <b>CHECKED:</b> | Richard Poole (Principal Ecologist) | <b>APPROVED:</b>        | Geraint Pitman (Associate Director) |

**Table A-2 – Valuing commuting routes (scoring levels in brackets)**

| Species            | Number of bats            | Roots/potential roosts nearby                                  | Type and complexity of linear feature  |
|--------------------|---------------------------|--|--|
| <b>Common (2)</b>  | Individual bats (5)       | None (1)   | Absence of (other) linear features (1)   |
| -                  | -                         | Small number (3)   | Unvegetated fences and large field size (2)  |
| <b>Rarer (5)</b>   | Small number of bats (10) | Moderate number/not known (4)                                  | Walls, gappy or flailed hedgerows, isolated well-grown hedgerows, and moderate field sizes (3) |
| -                  | -                         | Large number of roosts, or close to a SSSI for the species (5) | Well-grown and well-connected hedgerows, small field sizes (4)                                 |
| <b>Rarest (20)</b> | Large number of bats (20) | Close to or within SAC for the species (20)                    | Complex network of mature and well-established hedgerows, small fields and rivers/streams (5)  |

**Table A-3 – Valuing foraging areas (scoring levels in brackets)**

| Species            | Number of bats            | Roots/potential roosts nearby                                  | Type and complexity of linear feature  |
|--------------------|---------------------------|--|--|
| <b>Common (2)</b>  | Individual bats (5)       | None (1)   | Industrial or other site without established vegetation (1)                            |
| -                  | -                         | Small number (3)   | Suburban areas or intensive arable land (2)  |
| <b>Rarer (5)</b>   | Small number of bats (10) | Moderate number/not known (4)                                  | Isolated woodland patches, less intensive arable and/or small towns and villages (3)   |
| -                  | -                         | Large number of roosts, or close to a SSSI for the species (5) | Larger or connected woodland blocks, mixed agriculture, and small villages/hamlets (4) |
| <b>Rarest (20)</b> | Large number of bats (20) | Close to or within SAC for the species (20)                    | Mosaic of pasture, woodlands and wetland areas (5)                                     |

# V3-S09/0004

## **DORMOUSE SURVEY REPORT**







Energy Recovery Investments Ltd

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# BEDWAS TIPS RECLAMATION

## Dormouse Survey Report





Energy Recovery Investments Ltd

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# **BEDWAS TIPS RECLAMATION**

## Dormouse Survey Report

**TYPE OF DOCUMENT (VERSION) CONFIDENTIAL**

**PROJECT NO. GC4277**

**OUR REF. NO. GC4277-WSP-74-XX-RP-L-0002**

**DATE: DECEMBER 2023**

WSP

1st Floor, Quest House  
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# QUALITY CONTROL

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| Issue/revision | First issue   | Revision 1 | Revision 2 | Revision 3 |
|----------------|---|------------|------------|------------|
| Remarks        |   |            |            |            |
| Date           | 19 December 2023  |            |            |            |
| Prepared by    | Tara Okon (Ecologist)   |            |            |            |
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| Checked by     | Janine Burnham (Principal Ecologist)  |            |            |            |
| Signature      |   |            |            |            |
| Authorised by  | Geraint Pitman (Associate Director)   |            |            |            |
| Signature      |  |            |            |            |
| Project number | GC4277  |            |            |            |
| Report number  | GC4277-WSP-74-XX-RP-L-0002 – P01  |            |            |            |
| File reference | GC4277-WSP-74-XX-RP-L-0002  |            |            |            |



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# EXECUTIVE SUMMARY

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WSP UK Ltd (WSP) was commissioned by Energy Recovery Investments Ltd to undertake a dormouse survey to accompany the planning application for the proposed Bedwas Tips Reclamation Scheme in Bedwas, Caerphilly Borough (Approximate Central Grid Reference: ST 17668 90526).

A total of 177 nest tubes were installed in suitable habitat in March 2023. A monthly check of their contents was undertaken between May and October 2023.

Generally, habitats within much of the Scheme including grassland/heath, spoil, pockets of sparse woodland, bracken and scattered trees were assessed as offering negligible suitability for dormice. Habitat suitability was as such restricted to woodland areas and patchy adjacent scrub mainly to the southern boundaries of Tip 1. Woodland along the proposed Haul Road was also considered to offer varying levels of potential for dormice although predominantly low.

No records for dormouse were returned via South East Wales Biodiversity Records Centre (SEWBRc) data searches within 1km of the Scheme.

No records and/or evidence of dormice (nests) were recorded during the survey.

Evidence of wood mouse activity in the form of nests, and cached nuts and berries, and/or live individuals was recorded in nine of the 177 tubes installed.

As dormice are considered likely absent from the Site no avoidance, mitigation or compensation measures focussed specifically on this species are required. Recommendation for habitat enhancement for dormouse comprises that where woodland habitat loss is unavoidable and replanting is required, consideration should be given to using locally sourced native species of value to dormouse e.g., hazel, hawthorn, and/or honeysuckle.

## **Contact name Geraint Pitman**

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# 1 INTRODUCTION

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- 1.1.1. WSP was commissioned by Energy Recovery Investments Ltd to undertake a dormouse (*Muscardinus avellanarius*) survey of the location for the proposed Bedwas Tips Reclamation Scheme in Bedwas, Caerphilly borough (Approximate Central Grid Reference: ST 17668 90526).
- 1.1.2. The principal objectives of the dormouse survey were:
- to establish presence or absence of dormouse within the survey area,
  - identify any constraints that dormouse may present to the proposed development, and
  - identify any requirements for mitigation and compensation measures.
- 1.1.3. This report includes details of the survey methodologies and results and contains recommendations for mitigation and compensation measures and post-construction monitoring where needed.
- 1.1.4. For clarity, this report refers to the location of the proposed works including two colliery tip sites (Tip 1 and Tip 2) and a proposed Haul Road as the 'Scheme' (see Figure 1-1).



**Figure 1-1 - Scheme location. Red line indicates approximate boundary of works area (Adapted from Google Earth, 2023).**

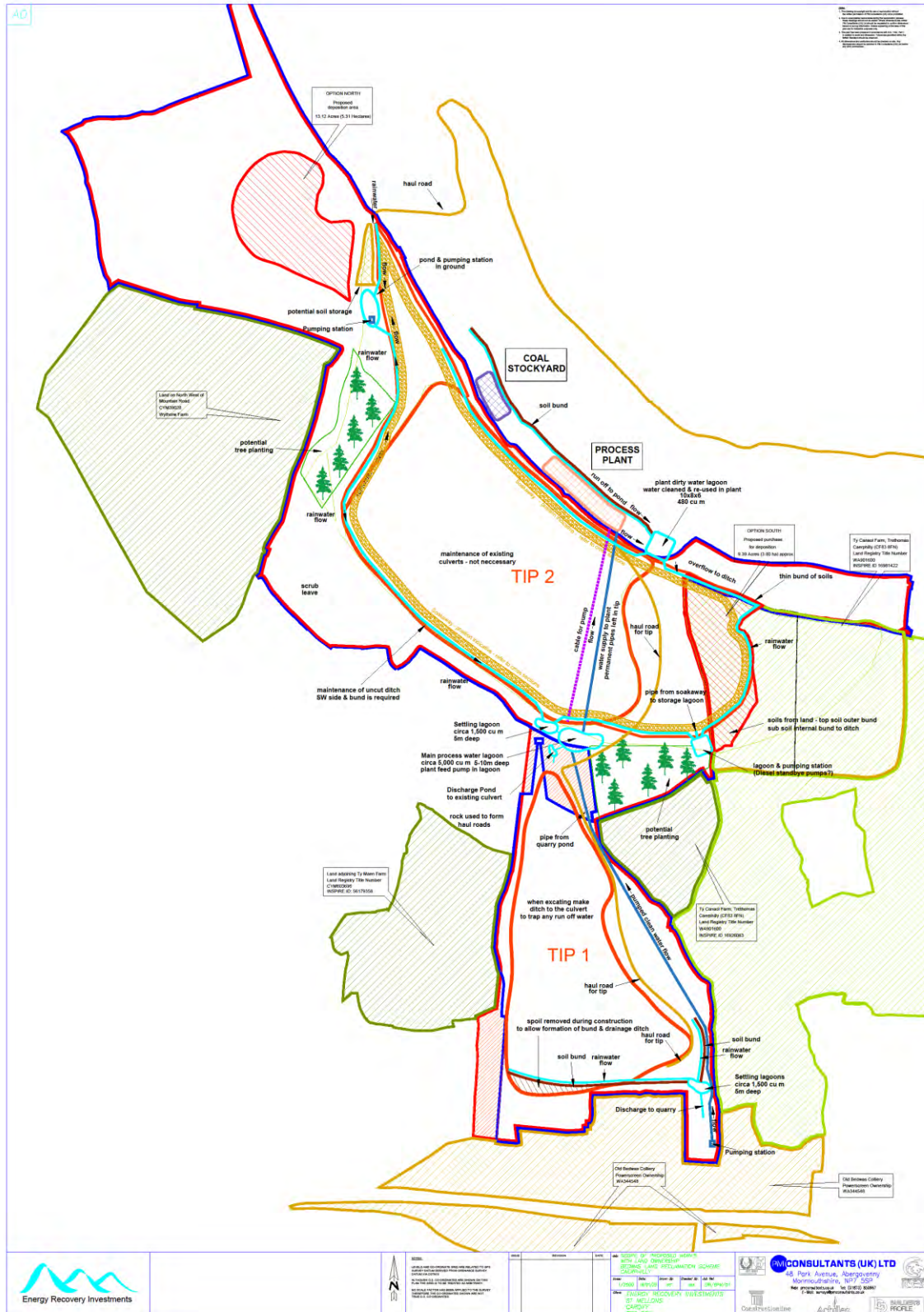
## 1.2 SCHEME DESCRIPTION

- 1.2.1. The Scheme was located within 1km of Bedwas, Caerphilly County Borough Council (CCBC), and covered an extensive area (approximately 139ha) including two existing coal tips on Mynydd y Grug and a track route connecting the northern tip site with the A467/B4251 roundabout. This track route will form the proposed Haul Road.
- 1.2.2. Land use surrounding the tips consisted mainly of agricultural land with pockets of woodland and scrub, with the urban development of Bedwas town situated to the south. To the north-west of the Scheme lay Mynydd y Grug Common, and to the north-east, Cwmfelinfach village, separated by a large strip of woodland and the Sirhowy river, which ran roughly parallel with the Haul Road to the north. The Scheme area lies partially within statutory and non-statutory designated sites.

## 1.3 PROPOSED WORKS

- 1.3.1. The purpose of the works is to restore the CCBC owned degraded and derelict land of the Bedwas coal spoil tips to a more natural habitat in keeping with the surrounding area. In the process, high ash coal will be extracted from the colliery spoil which will provide the means of funding the restoration. The land is to be suitable for upland grazing, thereby enhancing the natural environment and improving the resilience of ecosystems and ecological networks by:
- Re-landscaping in keeping with the natural character of the area
  - Improving site drainage and run-off water quality
  - Improving physical ground conditions and land stability
  - Promoting soil recovery, revegetation, and enhanced biodiversity
- 1.3.2. The proposed development will operate over a period of approximately six years and will be conducted in the following stages:
- Construction of the following: access road, clean water pond, sit bunding and water drainage channels, site water collection and treatment ponds, process plant, portable buildings for workers.
  - Excavation
  - Deposition
  - Reclamation
  - Decommissioning
  - Aftercare (5-year period)
- 1.3.3. The general arrangement for the works including the two tip sites and the proposed haul road is illustrated in Figures 1-2 and 1-3 below.
- 1.3.4. In this report where relevant the Scheme has been divided into Tip 1 and Tip 2, and the 'Haul Road', Tip 1 and Tip 2.
- 1.3.5. The general arrangement for the works including the two tip sites (referred to as Tip 1 and Tip 2 in this report) and the proposed haul road (referred to as 'Haul Road' in this report) is illustrated in Figures 1-2 and 1-3.





**Figure 1-2 - Constructional and Operational Plan**

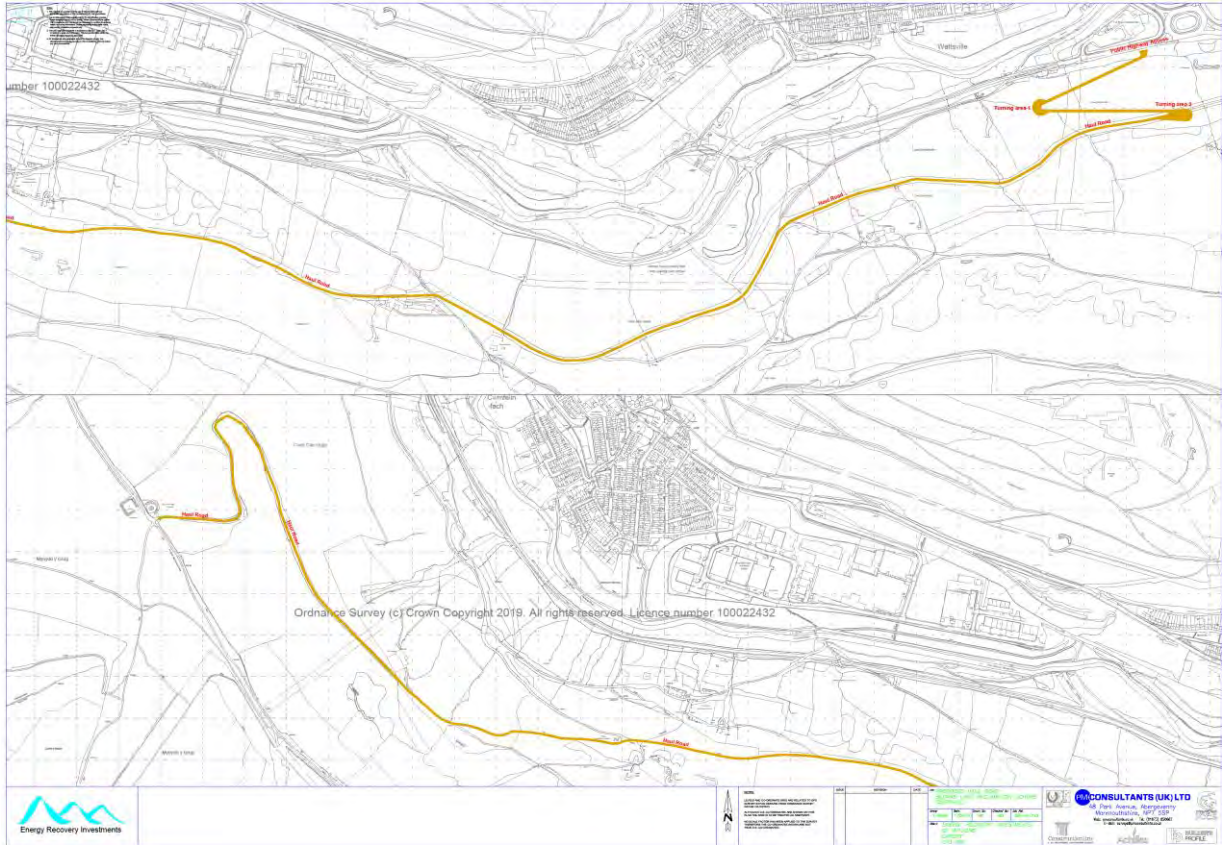


Figure 1-3 – Proposed Haul Road



## 2 DORMOUSE ECOLOGY, LEGISLATION & CONSERVATION STATUS

---

### 2.1 ECOLOGY

- 2.1.1. The hazel dormouse is a native species to the United Kingdom and has undergone a rapid decline in numbers and distribution over the last century.
- 2.1.2. The hazel dormouse is distinctive from other native small mammals, possessing an orange-brown coat (when adult), large dark eyes and a thickly furred tail.
- 2.1.3. The species is nocturnal and is active between April and late October, spending the remainder of the year in hibernation. However, even in the active season cold and wet weather can reduce activity and induce torpor. It is a highly arboreal species and in general dormice only descend to the ground to hibernate during the winter months.
- 2.1.4. Dormice typically live 2-3 years and first breed in the year following birth. Young are born between June and September and are weaned between 6-8 weeks later. The dormouse builds three types of nest: summer, breeding, and hibernation. The summer and breeding nests are usually located above ground in dense vegetation, holes in trees and hedgerows whilst winter hibernation nests are usually at or below ground level under moss, leaf-litter, old coppice stools and wood piles.
- 2.1.5. Optimal dormouse habitat is traditionally thought of as ancient semi-natural woodlands with mixed species-rich under storey; coppiced woodland and hedgerows are also important habitats; however the species have been recorded in other habitats such as dense scrub and conifer woodlands.
- 2.1.6. The rapid decline in dormouse populations can be attributed to a variety of factors including direct habitat loss, isolation, and other habitat fragmentation effects.

### 2.2 LEGISLATION

- 2.2.1. Dormouse and their habitats are strictly protected by a range of legislation and policy, including:

- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019
- Wildlife and Countryside Act 1981, as amended
- Countryside and Rights of Way Act 2000

Offences under this legislation include:

- Deliberate capture, injury or killing
- Deliberate disturbance; and
- Damage or destruction of a breeding site or resting place of such an animal.

- 2.2.2. Additionally, dormouse is a Species of Principal Importance (SPI) for the conservation of biodiversity under the Environment (Wales) Act 2016 and local authorities are to have regard for the conservation of this species.

## 3 CONSERVATION STATUS

---

### 3.1 NATIONAL LEVEL

- 3.1.1. In Britain, dormice are found almost entirely south of a line between Shropshire and Suffolk. Data shows that, since 2000, the dormouse population has fallen by half (51%), decreasing on average by 3.8% per year (PTES, 2019). The species is under threat in Britain and qualifies as 'Vulnerable' to extinction under Red List criteria.

### 3.2 LOCAL/REGIONAL LEVEL

- 3.2.1. Dormice are found in every Welsh county except Anglesey but live in low-density populations throughout their range. Wales is on the edge of the distribution range for the species in Britain (Bright, 1995) and records indicate that their numbers decreased in Wales by around 20% between 1991 and 2000 (Natural Resources Wales, 2021) and are still decreasing.



## 4 METHODOLOGY

### 4.1 DESKTOP STUDY

4.1.1. The following organisations/persons were consulted for ecological information about the Scheme and surrounding areas:

- South East Wales Biodiversity Records Centre (SEWBRc, 2022);
- Multi-Agency Geographic Information System (MAGIC, 2022);

4.1.2. A request to SEWBRc was made for information on any ecologically designated sites, habitats and protected species within a 1km (5km for bats) radius of the Scheme (SEWBRc, 2022). This also included priority/protected species listed under Section 7 of the Environment (Wales) Act 2016.

4.1.3. Where third party data is referred to, for example from online searches and Biodiversity Record Centre data, WSP cannot be held responsible for the accuracy of the information.

### 4.2 HABITAT ASSESSMENT

4.2.1. Habitats within the Scheme plus a 50m boundary were assessed for their potential to support dormouse using a combination of aerial photographs and assessments made during the Extended Phase 1 Habitat survey (detailed fully in the Preliminary Ecological Appraisal (PEA) Report (WSP,2023).

Some key features considered favourable for dormouse include:

- Presence of broadleaved woodland
- Structurally diverse canopy cover
- Structurally diverse understory
- Presence of nest making materials
- Presence of developed hedgerows
- Presence of suitable food resources
- Dense understory to provide shelter during hibernation.

4.2.2. The habitats were assessed using information in the Dormouse Conservation Handbook (Bright et al., 2006) which is reproduced in Table 3-1:

**Table 4-1 – Probability of dormouse presence in habitats.**

| Increased Probability  | Decreased Probability  |
|--|--|
| ▪ Large woods  | ▪ Small wood   |
| ▪ Adjacent to ancient woodland or Plantations on Ancient Woodland Sites (PAWS) | ▪ Old conifer plantation subject to thinning   |
| ▪ Wide range of broadleaved species present                                    | ▪ Isolated from other woodland or adjacent to older conifer plantation subject to thinning |
| ▪ Species-rich shrub layer   | ▪ Little or no shrub understorey   |
| ▪ Species-rich edge strip or ride margins                                      | ▪ No fruiting broadleaved trees  |
| ▪ Thick, wide hedgerow connections to nearby suitable woodlands                | ▪ High local deer population   |
| ▪ Contains hazel or sweet chestnut coppice                                     | ▪ Presence of cattle, sheep or pigs  |

| Increased Probability   | Decreased Probability  |
|---|--|
| <ul style="list-style-type: none"> <li>No thinning history</li> </ul> | <ul style="list-style-type: none"> <li>Seasonally waterlogged ground</li> </ul>                    |
|   | <ul style="list-style-type: none"> <li>Derelict coppice or clear felled in large coupes</li> </ul> |
|   | <ul style="list-style-type: none"> <li>Site more than 300m above sea level</li> </ul>              |

4.2.3. Following review of the habitats within and adjacent to the Scheme, suitable habitat areas were selected for installation of nest tubes. Locations of the installed dormouse nest tubes are illustrated on Drawing GC4277-WSP-74-XX-M2-L-3006.

### 4.3 NEST TUBE SURVEY

4.3.1. The surveys were conducted in accordance with best practice guidance set out in the Dormouse Conservation Handbook (Bright et al., 2006).

4.3.2. Dormouse nest tubes when placed in suitable habitat may be used by dormouse to nest. Their summer nests can often be identified by a number of key characteristics:

- They often incorporate strips of honeysuckle (*Lonicera periclymenum*) bark, or other shredded bark and green leaves
- They lack an obvious entrance hole.

4.3.3. Dormouse nest tubes, constructed from folded corrugated plastic sheeting with a sliding plywood base sealed at one end by a wooden block mounted on the tray, were installed in suitable habitat within the footprint and directly adjacent habitats of the proposed Scheme.

4.3.4. A total of 177 nest tubes were installed between 28 and 30 March 2023, at least one month before the first survey visit, to allow dormouse time to find and nest in the tubes. Each nest tube was given a number and its location recorded using QField on a Samsung Galaxy Tab S7. The location of the nest tubes is shown on Drawing GC4277-WSP-74-XX-M2-L-3006.

4.3.5. All tubes were checked for the presence of dormice or their nests for a total of seven surveys between May and October 2023. Due to the fact that a visit was not undertaken in April, two visits were carried out in August when the probability of detection is higher due to this being the time when juveniles are most likely to disperse away from nest sites. At least one Natural Resources Wales Licence holder for dormouse was present on each survey visit.

4.3.6. The dates and details of each survey are provided in Appendix A, survey results are provided in Appendix B, and supporting photographs for the report are provided in Appendix C.

4.3.7. Dormice can make a range of nests but the key features that suggest dormouse activity, are the presence of a number of green leaves in the box, and/or the presence of a tightly woven nest. Due to the confined internal space of nest tubes, it can sometimes be quite hard to confirm whether a nest that is present is actually a dormouse nest as they can sometimes lack structure, therefore for the purpose of this report, nests recorded were categorised as ‘actual’, ‘probable’ or ‘possible’, depending on the features present (see Table 3-2).



**Table 4-2 – Nest category and description**

| <b>Nest category</b> | <b>Description</b>   |
|----------------------|--|
| Actual               | Dormouse present, or a well-structured, woven nest present with green leaves and/or shredded nesting materials. No distinctive smell of wood mouse ( <i>Apodemus sylvaticus</i> ). |
| Probable             | A nest lacking or with a loose structure with some green leaves and/or shredded nesting materials present. No distinctive smell of wood mouse.                                     |
| Possible             | Incomplete nests but with some green leaves and/or shredded nesting material present. No distinctive smell of wood mouse.  |

- 4.3.8. All nest tubes were removed on completion of the survey in October 2023. Tubes containing actual/probable/possible dormouse nests were left in situ as these may still have been in use by dormouse.
- 4.3.9. The number of the nest tubes deployed, and the timing of the survey met the requirements for a robust survey (Bright et al., 2006). This is defined as a survey in which the combined dormouse detection probability scores from Table 3-3 exceed 20 points and the survey is conducted over a minimum period of five months. The calculation takes 50 nest tubes as a standard and therefore, for example, 50 tubes left out for the whole season scores 25 (the sum of the indices for all 8 months, April - November), (Chanin & Woods 2003). For this survey, 177 nest tubes were installed and surveyed between May and October 2023 and therefore the calculation is based on these details. See Table 3-3.

**Table 4-3 – Index of likelihood of recording dormice in any one month based on the installation of 177 nest tubes (Chanin and Woods, 2003).**

| <b>Month</b>                                | <b>Probability Index for 50 tubes</b> | <b>Probability Index for 177 tubes<br/>Index for 50 tubes x 177/50)</b> |
|---|---------------------------------------|---|
| May   | 4                                     | 14.16   |
| June  | 2                                     | 7.08  |
| July  | 2                                     | 7.08  |
| August                                      | 5                                     | 17.7  |
| September                                   | 7                                     | 24.78   |
| October                                     | 2                                     | 7.08  |
| <b>Overall Probability Index for survey</b> |                                       | <b>77.88</b>  |

## 4.4 SURVEY CONSTRAINTS

- 4.4.1. Dormice are nocturnal and difficult to observe, and surveys therefore usually rely on finding evidence of their presence such as their nests and distinctively opened nuts. Nests can be removed by heavy rain, high winds, and human disturbance.
- 4.4.2. No tubes were deployed along several sections of the Haul Route due to steep sided rock cuttings restricting access to the woodland. Habitat in these areas was considered sub-optimal for dormouse and as such this is unlikely to affect results.



- 4.4.3. During the surveys there were nest tubes that could not be located due to a combination of vegetation growth and loss of markers. Occasionally nest tubes were missing or the insert had fallen out. Missing tubes and inserts were replaced.
- 4.4.4. By the time of the final survey all tubes except 12, 22, 23, 54, and 135 had been relocated. As such the survey remained robust as the majority of nest tubes were checked across the duration of the survey and the low number of missing tubes would not have a significant impact on the overall results of this report.
- 4.4.5. Any ecological survey can only identify what was present on site at the time it was conducted, and habitat use by species can change over time. The length of time survey data remains valid will depend on a case-by-case basis, but it is considered that if development or proposed works do not commence within 2 years of the last survey date of this report an update may be required.



## 5 RESULTS

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### 5.1 REVIEW OF DESKTOP STUDY DATA

- 5.1.1. No records for hazel dormouse within the last 10 years were returned from 1km data searches.
- 5.1.2. The Mynydd Bach Slopes, East of Llanbradach SINC located adjacent west of northern section of the Scheme and Craig y Prisiad Woodlands, Ynysddu SINC, located 100m north of the Haul Road, are also cited as containing suitable habitat and having potential to support dormice (CCBC, 2007a & b).

### 5.2 HABITAT ASSESSMENT

- 5.2.1. In general, habitats within much of the Scheme including grassland/heath, spoil, pockets of sparse woodland, bracken and scattered trees were assessed as offering negligible suitability for hazel dormice during the PEA survey (WSP, 2023).
- 5.2.2. Habitats with suitability were restricted to woodland areas and adjacent patchy scrub mainly to the southern boundaries of the Tip 1. The preferred nesting and food resource of dormouse, hazel (*Corylus avellana*), was also more prevalent at the southern extent of the Scheme.
- 5.2.3. Woodland along the Haul Road which transitioned between broadleaved, mixed and coniferous woodland with a changeable shrub layer density was considered to offer varying levels of potential for dormice although predominantly low. Hedgerows were infrequent in the Scheme but may offer some potential for nesting and foraging and habitat connectivity.
- 5.2.4. Predators such as grey squirrel (*Sciurus carolinensis*) and birds of prey were noted within the Scheme. Domestic cats from residential properties at the most southerly extent of the Scheme were also considered highly likely to be present.

### 5.3 NEST TUBE SURVEY

- 5.3.1. No dormice or dormice nests (inclusive of possible, probable, and actual nests) were recorded during the survey.
- 5.3.2. Evidence for the presence of wood mouse in the form of nests, and cached nuts and berries, as well as live individuals was recorded in nine of the 177 tubes installed. For details see Appendix B, and for photographs of examples of wood mouse nests see Appendix C.



## 6 DISCUSSION AND CONCLUSIONS

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- 6.1.1. No records for dormouse were returned via SEWBRc searches although their arboreal and nocturnal nature can often mean the species is under-recorded.
- 6.1.2. No dormouse and/or evidence of dormice (nests) were however recorded during the survey visits. As the survey effort was robust and covered all suitable habitat areas within the Scheme area it can therefore be assumed that this species is absent and there will be no negative effect caused by the development on the species.



## 7 RECOMMENDATIONS AND ENHANCEMENTS

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- 7.1.1. As dormice are considered likely absent from the Site no avoidance, mitigation or compensation measures focussed specifically on this species are required.
- 7.1.2. Planning Policy Wales 11 (Welsh Government, 2021) advocates the enhancement of biodiversity in relation to sites. As dormouse is likely absence from the Scheme no enhancement measures specifically targeted for the species are considered necessary, however the following measures are recommended to improve and enhance the area for potential future use by dormouse:

### 7.2 REPLANTING

- 7.2.1. Where woodland habitat removal is unavoidable and re-planting is required, consideration should be given to using locally sourced native species of value to dormouse e.g., hazel, hawthorn, and honeysuckle. This would improve the habitat for potential future use by dormice.

## 8 REFERENCES

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- Bright, P., Morris, P. & Mitchell-Jones, A. (2006). The dormouse conservation handbook 2nd Edition. English Nature, Peterborough
- Bright, P.W. (1995). Distribution of the Dormouse *Muscardinus avellanarius* in Wales, on the edge of its range, Mammal Review
- Caerphilly County Borough Council (CCBC) (2007a). Sites of Importance for Nature Conservation in Caerphilly County Borough Council. Craig y Prisiad Woodlands, Ynysddu
- Caerphilly County Borough Council (CCBC) (2007b). Sites of Importance for Nature Conservation in Caerphilly County Borough Council. Mynydd Bach Slopes, east of Llanbradach
- Chanin, P. & Woods, M. (2003). Surveying dormice using nest tubes: results and experiences from the South West Dormouse Project. English Nature Research Report 524. Peterborough: English Nature
- CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland, Version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester, edited April 2022
- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.
- Environment (Wales) Act (2016).
- Google Earth (2023).
- South East Wales Biodiversity Records Centre (SEWBReC) (2022). Biodiversity Information Search –Bedwas Tips [Ref: 7000956].
- Wildlife and Countryside Act (1981). (As amended).
- WSP (2023) Bedwas Tips Reclamation Preliminary Ecological Appraisal (PEA) Report

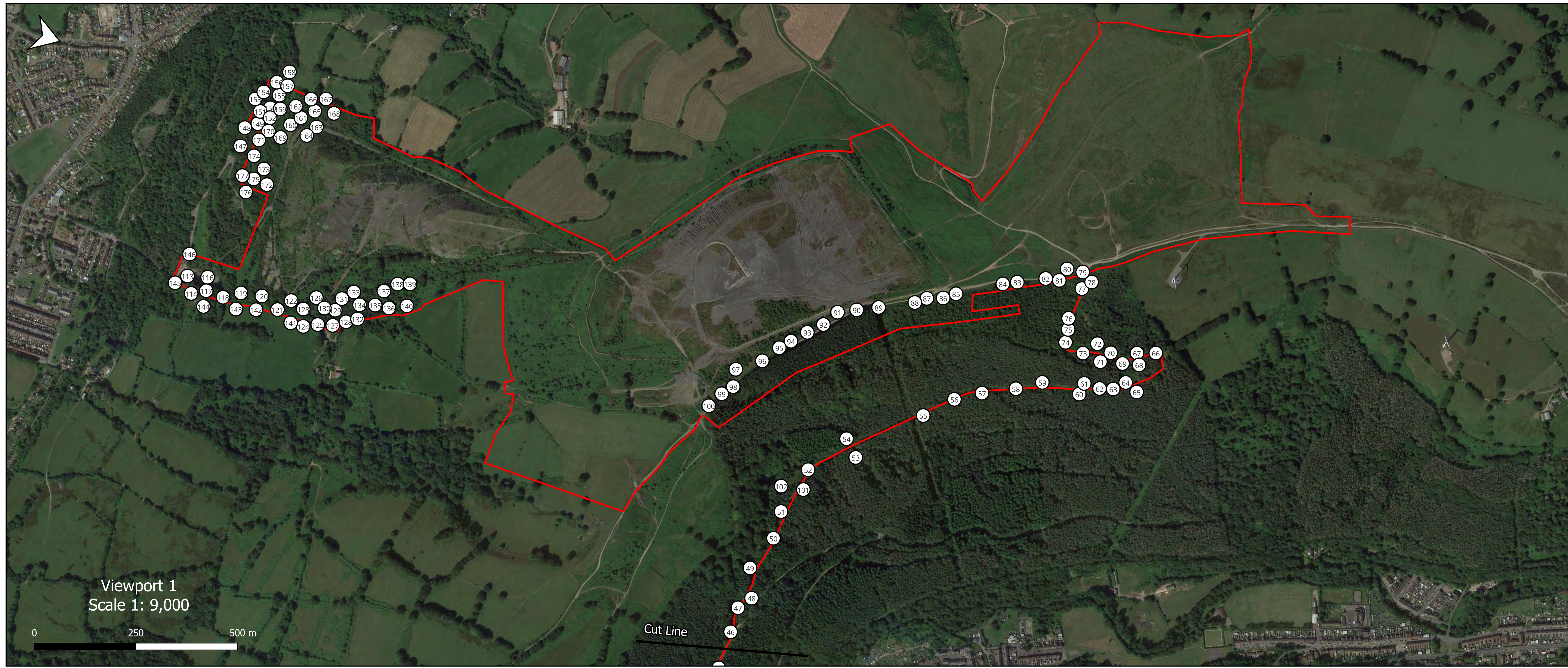




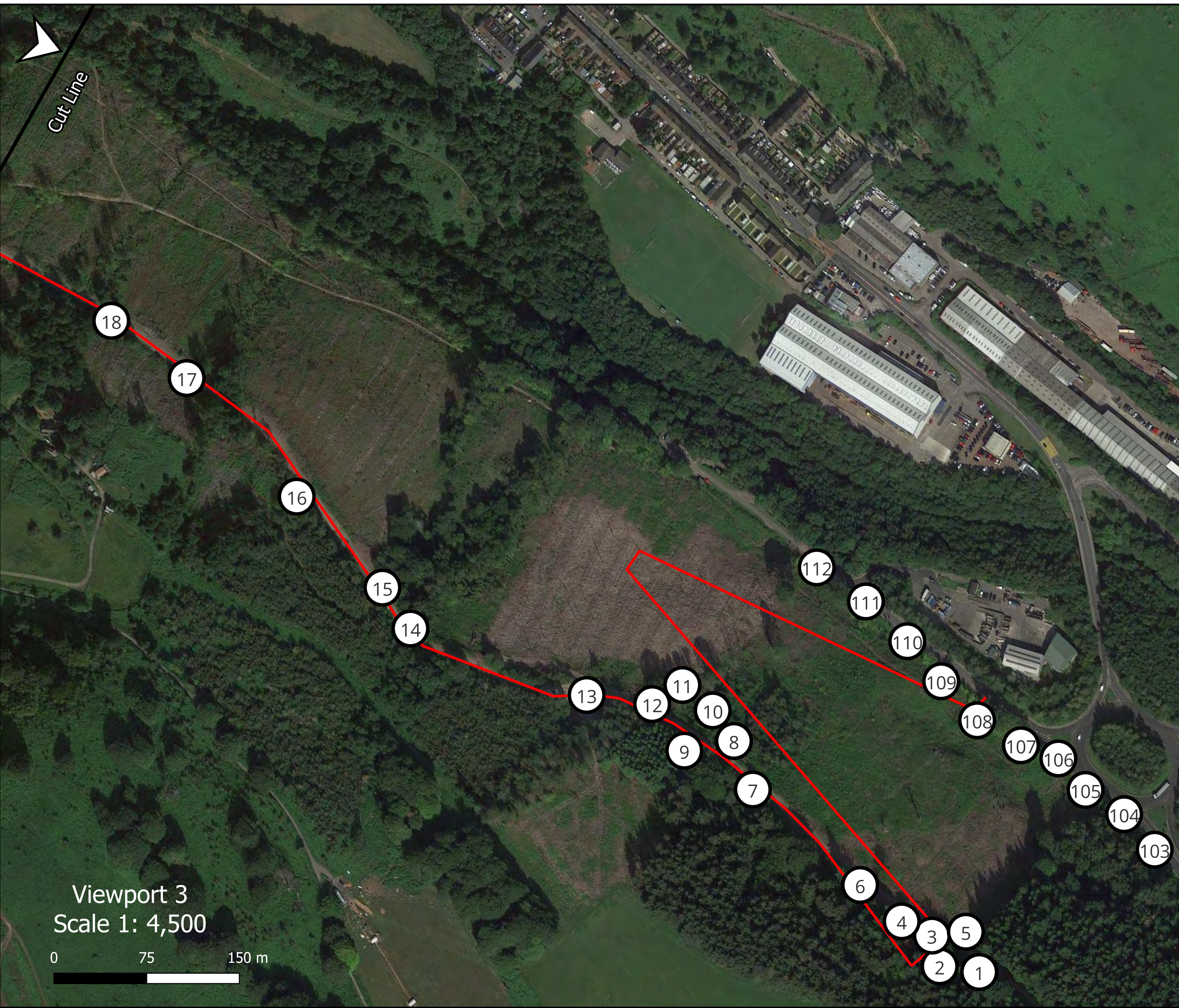
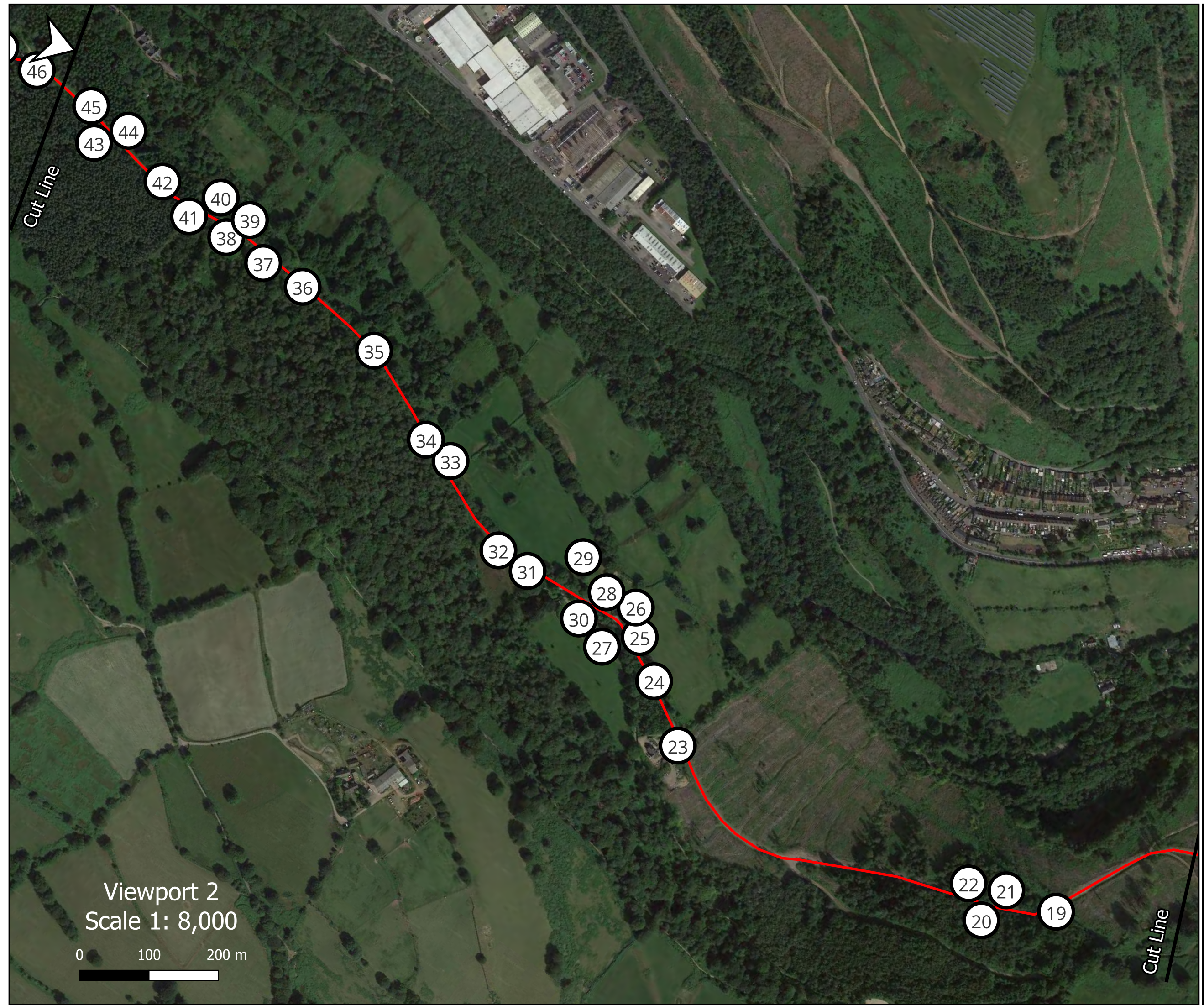
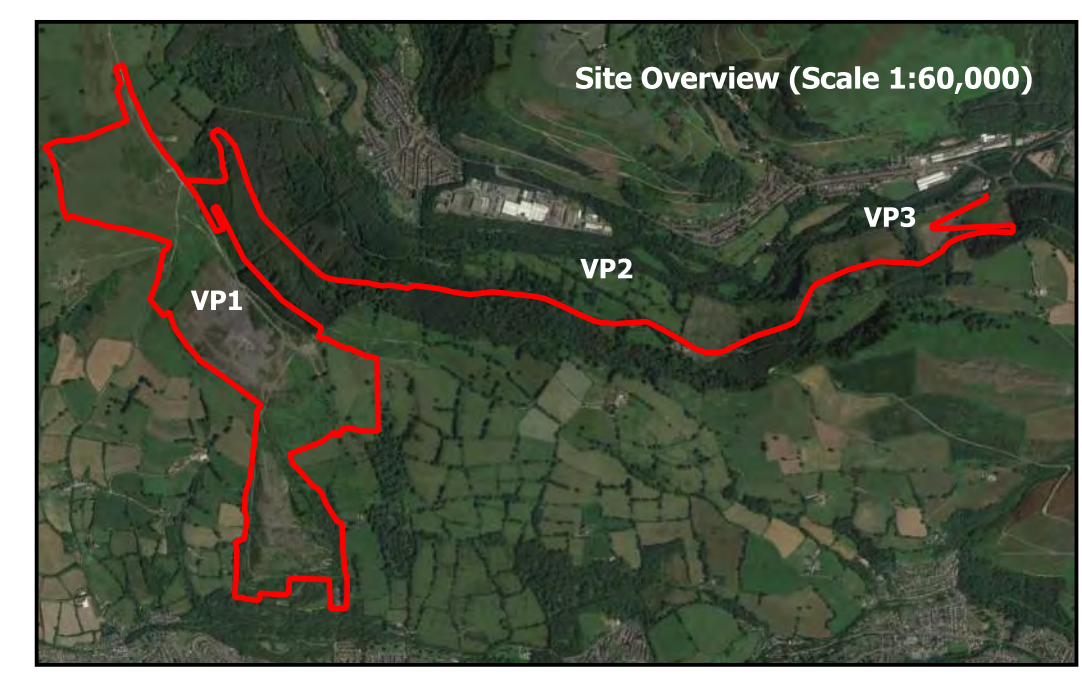
## **DRAWINGS**

GC4277-WSP-74-XX-M2-L-3006 - Dormouse Survey - Nest Tube Locations Map





Key:  
 ○ Dormouse Tube Locations  
 — Redline Boundary



|  |              |               |        |               |            |
|--|--------------|---------------|--------|---------------|------------|
| P01  | NP           | TO            | GP     | First Issue.  | 19/12/2023 |
| Rev  | Drwn         | Chk'd         | Appr'd | Description   | Date       |
| Purpose of issue                                 |              |               |        |               |            |
| <b>S2 - Issued for Information</b>               |              |               |        |               |            |
| Classification                                   |              |               |        |               |            |
| <b>Confidential</b>                              |              |               |        |               |            |
| Client   |              |               |        |               |            |
| <b>Energy Recovery Investments</b>               |              |               |        |               |            |
| Project  |              |               |        |               |            |
| <b>Bedwas Tip</b>                                |              |               |        |               |            |
| Drawing Title                                    |              |               |        |               |            |
| <b>Dormouse Survey - Nest Tube Locations Map</b> |              |               |        |               |            |
| Drawn  | NP           | Checked       | TO     | Approved      | GP         |
| Project No                                       | Date         | Scale         | Size   |               |            |
| GC/004277  | October 2023 | See Viewports | A1     |               |            |
| Drawing identifier                               |              |               |        | Revision: P01 |            |
| <b>GC4277-WSP-74-XX-M2-L-3006</b>                |              |               |        |               |            |



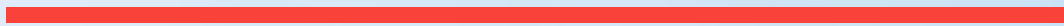
Quest House, St Mellons Business Park, Fortran Rd, St. Mellons, Cardiff, CF3 0EY





# Appendix A

## **DORMOUSE NEST TUBE SURVEY DETAILS**



### Dormouse nest tube survey details

| Survey visit               | Date of survey visit     | Surveyors  | Weather conditions   |
|----------------------------|--------------------------|--|--|
| Installation of nest tubes | 28, 29 and 30 March 2023 | Emma Carney (Senior Ecologist, NRW licence holder for dormouse), Tara Okon (Ecologist, NRW licence holder for dormouse), Megan Watts (Ecologist) & Natalie Pyatt (Ecological Technician) | N/A  |
| 1                          | 24 and 25 May 2023       | Tara Okon (Ecologist, NRW licence holder for dormouse), Megan Watts (Ecologist) & Charlotte Gurney-Read (Ecologist)  | Mild & sunny<br>16-19°C<br>No precipitation                            |
| 2                          | 21 and 22 June 2023      | Tara Okon (Ecologist, NRW licence holder for dormouse), Richard Poole (Principal Ecologist) & Emma Carney (Senior Ecologist, NRW license holder for dormouse)                            | Mild with sunny spells<br>16-22°C<br>No precipitation                  |
| 3                          | 17 and 19 July 2023      | Emma Carney (Senior Ecologist, NRW licence holder for dormouse), Tara Okon (Ecologist, NRW licence holder for dormouse)  | Warm with sunny spells<br>17-28°C<br>No precipitation                  |
| 4                          | 09 and 10 August 2023    | Emma Carney (Senior Ecologist, NRW licence holder for dormouse) & Charlotte Gurney-Read (Ecologist)  | Cloudy with sunny spells<br>17-22°C<br>No precipitation                |
| 5                          | 30 and 31 August 2023    | Tara Okon (Ecologist, NRW licence holder for dormouse) & Megan Watts (Ecologist)   | Cloudy<br>14-18°C<br>Showers with rain more persistent on 31st August. |
| 6                          | 28 and 29 September 2023 | Tara Okon (Ecologist, NRW licence holder for dormouse), Natalie Pyatt (Ecological Technician)  | Cloudy with sunny spells<br>12-17°C<br>No precipitation                |
| 7 & collection of tubes    | 11 and 12 October 2023   | Tara Okon (Ecologist, NRW licence holder for dormouse), Megan Watts (Ecologist), and   | Cloudy<br>16-18°C<br>Light rain showers clearing on 11 October 2023.   |



# Appendix B

## **SURVEY RESULTS SUMMARY**





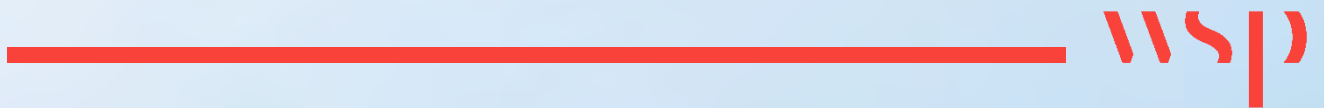
### Dormouse Survey results summary

| Nest tube no. | 24 and 25 May 2023                             | 21 and 22 June 2023              | 17 and 19 July 2023                              | 09 and 10 August 2023 | 30 and 31 August 2023              | 29 and 30 September 2023 | 11 & 12 October 2023   |
|---------------|--|----------------------------------|--|-----------------------|------------------------------------|--------------------------|------------------------|
| 25            | -  | -                                | -  | -                     | -                                  | -                        | Wood mouse nest        |
| 27            | -  | -                                | -  | -                     | -                                  | -                        | Wood mouse nest        |
| 29            | -  | -                                | -  | -                     | Wood mouse cache with a few leaves | Wood mouse cached nuts   | Wood mouse cached nuts |
| 35            | -  | -                                | Single acorn in tube – probable wood mouse cache | -                     | -                                  | -                        | -                      |
| 91            | -  | -                                | -  | -                     | -                                  | -                        | Wood mouse nest        |
| 101           | -  | -                                | -  | -                     | -                                  | -                        | Wood mouse nest        |
| 120           | Blue tit nest – adult on nest with 6 warm eggs | Blue tit nest – eggs failed      | Blue tit nest – eggs failed. Tube emptied.       | -                     | -                                  | -                        | -                      |
| 130           | -  | -                                | -  | -                     | -                                  | -                        | Wood mouse nest        |
| 136           | Start of tit species nest - moss               | Start of tit species nest - moss | As previous. Tube emptied.                       | -                     | -                                  | -                        | -                      |
| 138           | -  | -                                | -  | Adult wood mouse      | -                                  | -                        | -                      |
| 139           | Start of tit species nest - moss               | Start of tit species nest - moss | As previous. Tube emptied.                       | -                     | -                                  | -                        | -                      |
| 140           | Blue tit nest – adult on nest with 6 warm eggs | Blue tit nest – 3 eggs failed    | As previous. Tube emptied.                       | -                     | -                                  | -                        | -                      |
| 166           | Start of tit species nest - moss               | Start of tit species nest - moss | As previous. Tube emptied.                       | -                     | -                                  | -                        | -                      |
| 177           | Start of tit species nest - moss               | Start of tit species nest - moss | As previous. Tube emptied.                       | -                     | Young adult wood mouse & nest.     | Wood mouse nest          | Wood mouse nest        |



# Appendix C

## PHOTOGRAPHS





1. Example of wood mouse nest in Tube 101 with loosely layered leaves – September 2023



2. Example of wood mouse nest in Tube 91 with dead leaves and some green leaves loosely layered – October 2023





1st Floor, Quest House  
St Mellons Business Park, Fortran Road  
St Mellons, Cardiff  
CF3 0EY

**wsp.com**

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# V3-S09/0005

## **GREAT CRESTED NEWT SURVEY REPORT**







Energy Recovery Investments Ltd

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# BEDWAS TIPS RECLAMATION

## Great Crested Newt Survey Report





Energy Recovery Investments Ltd

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# BEDWAS TIPS RECLAMATION

## Great Crested Newt Survey Report

**TYPE OF DOCUMENT (VERSION) CONFIDENTIAL**

**PROJECT NO. GC4277**

**OUR REF. NO. GC4277-WSP-74-XX-RP-L-0004**

**DATE: DECEMBER 2023**

WSP




WSP in the UK,  
Quest House,  
St Mellons Business Park,  
Fortran Rd, St Mellons  
Cardiff  
CF3 0EY





# QUALITY CONTROL

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| Issue/revision | First issue   | Revision 1 | Revision 2 | Revision 3 |
|----------------|---|------------|------------|------------|
| Remarks        |   |            |            |            |
| Date           | December 2023   |            |            |            |
| Prepared by    | Emma Carney   |            |            |            |
| Signature      |    |            |            |            |
| Checked by     | Trevor Fletcher   |            |            |            |
| Signature      |   |            |            |            |
| Authorised by  | Richard Poole   |            |            |            |
| Signature      |  |            |            |            |
| Project number | GC4277  |            |            |            |
| Report number  | GC4277-WSP-74-XX-RP-L-0004-P01  |            |            |            |
| File reference | GC4277-WSP-74-XX-RP-L-0004  |            |            |            |



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## ***DRAWINGS***

GC4277-WSP-74-XX-M2-L-3003 – Great Crested Newt Survey Results

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# EXECUTIVE SUMMARY

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Great crested newt (GCN) surveys, comprising Habitat Suitability Index (HSI) assessment and environmental DNA (eDNA) sampling, were undertaken by WSP in 2023 in respect of the proposed Bedwas Tips Reclamation Scheme.

Ten waterbodies were identified within 500m of the Site (reduced to 250m around the main section of the Haul Road in which minimal works are anticipated) and these were subject to HSI assessment.

Following HSI assessment, four waterbodies with a 'Below average' and above HSI score were progressed to eDNA surveys. One pond returned a positive eDNA result for GCN and GCN eggs were present. GCN eggs were also identified in a second pond. No GCN eggs were identified in Ponds 4 or 6.

Based on the survey results, it is considered GCN is likely to be using terrestrial habitat within the common land in and surrounding the Site where these habitats fall within the 500m zones of Ponds 2/2b and 3 to the north-west of the Site. Where any works occur within these 500m zones there is potential for accidental injury/killing or disturbance to this species during the construction/operational phases of the Scheme.

Providing adequate mitigation measures are incorporated into the Scheme's progression a low magnitude of impact to GCN is anticipated. If all recommended enhancement measures i.e., creation of wildlife ponds and hibernacula, are incorporated into the Scheme design there may be an overall neutral to minor beneficial impact to GCN in the long-term.

# 1 INTRODUCTION

---

WSP was commissioned by Energy Recovery Investments Ltd to undertake a great crested newt (GCN) survey for the proposed Bedwas Tips Reclamation Scheme in Bedwas, Caerphilly County Borough (Approximate Central Grid Reference: ST 17668 90526).

The principal aims of the GCN survey was to identify the suitability of aquatic habitats to support GCN within and immediately surrounding the Scheme and determine presence/likely absence of the species by testing all suitable waterbodies for GCN environmental DNA (eDNA).

The survey results were used to determine any constraints that GCN and the habitats that they use during their breeding, terrestrial and hibernation stages, may present to the proposed Scheme.

This report includes details of the survey methodologies and results and contains recommendations for further survey, mitigation/compensation measures, and post-construction monitoring where required.

This report refers to the location of the proposed works (including the two tip sites and proposed haul road) as the 'Site' (see Figure 1-1) and the wider surveyed area as the 'survey area'.



Figure 1-1 - Site location. Red line indicates approximate boundary of works area.

## 1.1 SCHEME DESCRIPTION AND PROPOSED WORKS

The Site is located within 1km of Bedwas, Caerphilly County Borough (CCB) and covers a large area (approximately 139ha) including two existing coal tips on Mynydd y Grug and a track route connecting the northern tip site with the A467/B4251 roundabout which will form a haul road.

The purpose of the works is to restore the CCBC owned degraded and derelict land of the Bedwas coal spoil tips to a more natural habitat in keeping with the surrounding area. In the process, high ash coal will be extracted from the colliery spoil which will provide the means of funding the restoration. The land is to be suitable for upland grazing, thereby enhancing the natural environment and improving the resilience of ecosystems and ecological networks by:

- Re-landscaping in keeping with the natural character of the area;
- Improving site drainage and run-off water quality;





- Improving physical ground conditions and land stability;
- Promoting soil recovery, revegetation, and enhanced biodiversity.

The proposed development will operate over a period of approximately six years and will be conducted in the following stages:

- Construction of the following: access road, clean water pond, silt bunding and water drainage channels, site water collection and treatment ponds, process plant, portable buildings for workers.
- Excavation;
- Deposition;
- Reclamation.

## 1.2 LOCAL ECOLOGY

Land use within the Site is predominantly spoil, distributed across the two coal tip sites, whilst the proposed haul road is mainly located within woodland habitats. Land use surrounding the tip sites consists mainly of agricultural land with pockets of woodland. The urban settlement of Bedwas is situated to the south and to the north-east is Cwmfelinfach village, separated from the Site by a large strip of woodland and the Sirhowy river which runs roughly parallel with and to the north of the proposed haul road. The Site lies partially within statutory and non-statutory designated sites.

## 2 GREAT CRESTED NEWT ECOLOGY

---

GCN is the largest of the three species of newt that are native to the UK and are widely distributed throughout the lowlands of Great Britain. However, within the last century GCN has declined, mainly as a result of loss and deterioration of ponds.

GCN have aquatic egg and larval stages and are therefore dependent on water for breeding. Eggs are laid in suitable ponds usually between March and June, and the larvae (tadpoles) remain in the water for several weeks or months. Adults of each species typically spend six to nine months on land in invertebrate-rich feeding areas and over-winter in hibernacula which usually comprise loose ground with crevices in which the animals can shelter.

Many GCN occur in metapopulations (i.e., utilising a number of different ponds), therefore a cluster of ponds within a locality can be essential to newt survival. Fish are the major predators of newt larvae and eggs, therefore ephemeral ponds that are unable to sustain a fish population can be important newt breeding sites (Langton *et. al.*, 2001).

In winter, when temperatures fall below 5°C, GCN activity decreases and most animals will enter a state of hibernation, depending on local weather conditions.



## 3 LEGISLATION & CONSERVATION STATUS

---

### 3.1 LEGISLATION

GCN are a European Protected Species, and their breeding/resting sites are strictly protected by a range of legislation, including the following:

- The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019;
- Wildlife and Countryside Act 1981 (as amended); and
- Environment (Wales) Act (2016)

GCN are listed under Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. They are also fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

This legislation provides protection against killing, injury, disturbance, capture, taking, sale, and their breeding sites/resting places and places used for shelter/protection are also fully protected.

GCN are also Local Biodiversity Action Plan (LBAP) species within Caerphilly County Borough and are listed under Section 7 of the Environment Wales Act (2016) as of “principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales”.

Where a European protected species such as GCN is present, a development may only proceed under a licence issued by Natural Resources Wales (NRW) who are the appropriate authority responsible for issuing licences under Section 53 of The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

### 3.2 GCN CONSERVATION STATUS

#### 3.2.1 NATIONAL LEVEL

GCN is widespread throughout much of England and Wales, but occurs only sparsely in south-west England, mid Wales and Scotland. The species is absent from Northern Ireland. The UK population is relatively large, and estimates put the national population at around 400,000 animals in 18,000 breeding sites distributed over sites. Many of the largest populations are centred on disused mineral-extraction sites, but lowland farmland forms the majority of GCN habitat in the UK (JNCC, 2023).

Whilst widespread on a UK level, declines of this species across its European range has led to it being listed as an Annex IV species under the Habitats Directive (Council Directive 92/43/EEC).

#### 3.2.2 REGIONAL/LOCAL LEVEL

In Caerphilly, the species is known to be present in a number of localities including Sites of Importance for Nature Conservation (SINCs) Pwll-Gwinau, East of Newbridge and Nelson Pond, Tredomen (CCB LBAP, 2002). Other sites with confirmed populations include Halt Pond near Rudry and a disused quarry near Wyllie, Pontllanfraith (CCB LBAP, 2002). The species is of ‘local concern’ in Caerphilly Borough.

## 4 METHODOLOGY

---

### 4.1 DESK STUDY

A request to the South East Wales Biological Records Centre (SEWBRc) was made for information on any ecologically designated sites, habitats and protected species within a 1km radius (5km for bats) of the Site (SEWBRc, 2022). This included a request for data for priority habitats and species listed under Section 7 of the Environment (Wales) Act 2016.

The Multi-Agency Geographic Information for the Countryside (MAGIC website (MAGIC, 2022)) and Google Earth (Google Earth 2022) were used to identify any potential water bodies likely to support GCN within 500m of the site.

#### 4.1.1 REVIEW OF EXISTING REPORTS/SURVEYS

The following reports were reviewed to gain relevant information about the Site:

- ArbTech eDNA sampling results (for Pond 1 in this report) (SureScreen, 2019).
- Preliminary Ecological Appraisal (PEA) Report (WSP, 2023) for habitat information within the Site.

### 4.2 HABITAT SUITABILITY INDEX (HSI) ASSESSMENT

#### 4.2.1 WATERBODY IDENTIFICATION

Waterbodies within the survey area were identified through a combination of the following:

- Phase 1 habitat survey results – ponds/ditches within the Site and 50m Phase 1 survey buffer;
- MAGIC maps (MAGIC, 2023) – any further ponds between 50-500m of the Site;
- Google Satellite (Google, 2023) – as above.

Due to the extensive size of the Site the following parameters were applied when determining which waterbodies to assess:

- waterbodies within 500m of the main areas of works for the Site (i.e., Upper (Tip 2) and Lower (Tip 1) and eastern terminal point of the proposed haul road),
- waterbodies within 250m of the remaining sections of the proposed haul road (minimal works due to existing track).

A total of 10 waterbodies (ponds) were identified from this search, illustrated on Drawing GC4277-WSP-74-XX-M2-L-3003.

#### 4.2.2 HSI ASSESSMENTS

Habitat Suitability Index (HSI) assessments were undertaken by Emma Carney (Senior Ecologist — accredited agent on Holly Lewis and Trevor Fletcher's GCN NRW licences), assisted by Charlotte Gurney-Read (Ecologist) on the 04 April 2023.

The Habitat Suitability Index (HSI) is used as a means of evaluating the quality and quantity of a habitat to establish an indication of the level of suitability to support GCN.

The HSI assesses ten attributes (SI) in accordance with Oldham *et al.*, (2000), that are known to influence whether GCN is likely to be present, including:

- SI1 - Geographic location;
- SI2 - Pond size;





- SI3 - Pond permanence;
- SI4 - Water quality (based on invertebrate diversity within the pond)
- SI5 - Level of shading;
- SI6 - Waterfowl presence/absence;
- SI7 - Fish presence or absence;
- SI8 - Number of ponds within 1km;
- SI9 - Terrestrial habitat suitability; and
- SI10 - Macrophyte cover.

A value for each of these indices is calculated between 0.1 (unsuitable) and 1.0 (optimal).

A general description of the waterbody was recorded in the field along with information for each of the ten attributes, excluding the pond count within 1km (which was determined later using MAGIC maps (MAGIC, 2023)). The information for each of the attributes was converted into a score and the overall HSI score for each waterbody was calculated using the following formula (taken from Amphibian and Reptile Groups (ARG) habitat suitability index advice note (ARG, 2010):

$$\text{HSI} = (\text{SI1} \times \text{SI2} \times \text{SI3} \times \text{SI4} \times \text{SI5} \times \text{SI6} \times \text{SI7} \times \text{SI8} \times \text{SI9} \times \text{SI10})^{1/10}.$$

The HSI score estimates the ponds suitability for GCN, with higher scores indicating increased suitability, as shown in Table 4-1.

**Table 4-1 – HSI scores to define pond suitability for GCN (ARG, 2010).**

| HSI Score | Pond Suitability |
|-----------|------------------|
| <0.5      | Poor             |
| 0.5-0.59  | Below average    |
| 0.6-0.69  | Average          |
| 0.7-0.79  | Good             |
| >0.8      | Excellent        |

## 4.3 ENVIRONMENTAL DNA (eDNA) SAMPLING

### 4.3.1 WATERBODY SELECTION FOR EDNA SAMPLING

Following evaluation of the local biological data records, HSI results, local conditions and professional judgement, ponds with HSI categorisation of below average and above were taken forward for eDNA sampling (Ponds 2, 2b, 4, and 6). Pond 3 was not progressed to eDNA sampling due to being directly connected to Ponds 2/2b via an outflow.

Ponds 1, 5 and the four small ephemeral waterbodies (Pond Ref 9) were scoped out and not progressed to eDNA sampling due to:

- HSI score/categorisations of Poor;
- Ephemeral nature; likely to dry up and/or lacking sufficient water levels for eDNA sampling i.e. below 5-10cm deep (Biggs *et al.*, 2014 – which advises not sampling water levels below 5-10cm due to risk of sediment loading in the sample);
- Lack of marginal, emergent and/or floating vegetation for egg laying / poor bankside access;
- Poor water quality (i.e., polluted/high sediment load, low invertebrate diversity);
- Shading by trees.

Additionally, no access was gained for close survey of Ponds 7 and 8 during the HSI survey. However, upon review of the surrounding habitat from aerial and site visit observations it was considered unlikely, if present, that GCN would venture into the Site due to the following:

- distance from Site approximately 300m and as such the Site is outside the main terrestrial habitat zone (0-250m);
- relatively steep and largely dry (open and grazed acid grassland) intervening topography between the 250-500m terrestrial zone of the ponds and the Site, with a predominantly short sward offering little cover for commuting individuals;
- distance from suitable ponds within/adjacent to the Site (over 750m);
- more suitable habitat for overwintering individuals was present to the south and west of the ponds, away from the Site.

As such Ponds 7 and 8 were also scoped out of eDNA sampling.

The ponds eDNA sampled are illustrated on Drawing GC4277-WSP-74-XX-M2-L-3003.

Four waterbodies were sampled on 09 May 2023 by Emma Carney (Senior Ecologist) and Charlotte Gurney-Read (Ecologist).

Sampling was undertaken during suitable weather conditions, avoiding periods of heavy rain which may put sampling at risk of cross contamination. Samples were taken in strict accordance with the published technical advice note Defra Science and Research Project WC1067 (Biggs *et al.*, 2014), and following the sampling procedure outlined by ADAS (eDNA kit provider and DNA analyser).

#### **4.4 EGG SEARCH**

During the HSI and eDNA sampling visits an egg search was also undertaken. GCN eggs are usually wrapped in the leaves of aquatic plants such as water mint (*Mentha aquatica*) and water forget-me-not (*Myosotis scorpioides*), or occasionally in dead leaves or overhanging grass leaves. Submerged vegetation within the littoral zone was examined for GCN eggs and it was often necessary to unwrap a folded leaf to identify the egg. This interference increases the risk of predation of an egg, therefore once an egg is found at a waterbody the use of this technique is ceased.

#### **4.5 BIOSECURITY BEST PRACTICE**

All surveys were undertaken in line with guidance outlined in the ARG UK Advice Note 4 Amphibian disease precautions: a guide for UK fieldworkers February 2008.

#### **4.6 SURVEY CONSTRAINTS**

The HSI for GCN is a measure of habitat suitability and is not a substitute for aquatic amphibian surveys. In general, waterbodies with high HSI scores are more likely to support GCN than those with low HSI scores but the system is not sufficiently precise to allow a definite conclusion as to presence/absence based on the HSI score alone. Evaluations of suitability were therefore made using a combination of local biological records data, HSI results, local conditions, and professional judgement. Where feasible (i.e., access, sufficient water levels) suitable ponds were then progressed for further eDNA sampling.

During the HSI surveys two ponds (Pond 7 & 8) were not closely assessed due to access restrictions on private land. A remote assessment of suitability for GCN was made using binoculars. No HSI score was calculated. This is not thought to have significantly affected results as these ponds were subsequently scoped out of further survey due to reasons outlined in Section 4.3.





Any ecological survey can only identify what was present on site at the time it was conducted, and habitat use by species can change over time. The length of time survey data remains valid will depend on a case-by-case basis, but it is considered that if the Scheme does not commence within two years of the date of the latest survey in this report an update may be required.

## 5 RESULTS

### 5.1 DESKTOP STUDY

The desktop study found two records for the presence of GCN within 500m of the Site. This included a record in 2015 for two male and two female individuals within one waterbody located approximately 15m west of the north-western corner of the Site. A further record for two juveniles found under corrugated sheeting was returned near a pond approximately 918m north of the north-western corner of the Site.

Several more ponds were identified during both online map and satellite image searches (MAGIC, 2023 & Google Earth, 2023) and results from the PEA Phase 1 habitat survey. These were mostly clustered around the boundaries of the northern tip. Further ponds were interspersed within 500m along the proposed haul road.

#### 5.1.1 REVIEW OF EXISTING SURVEY DATA/REPORTS

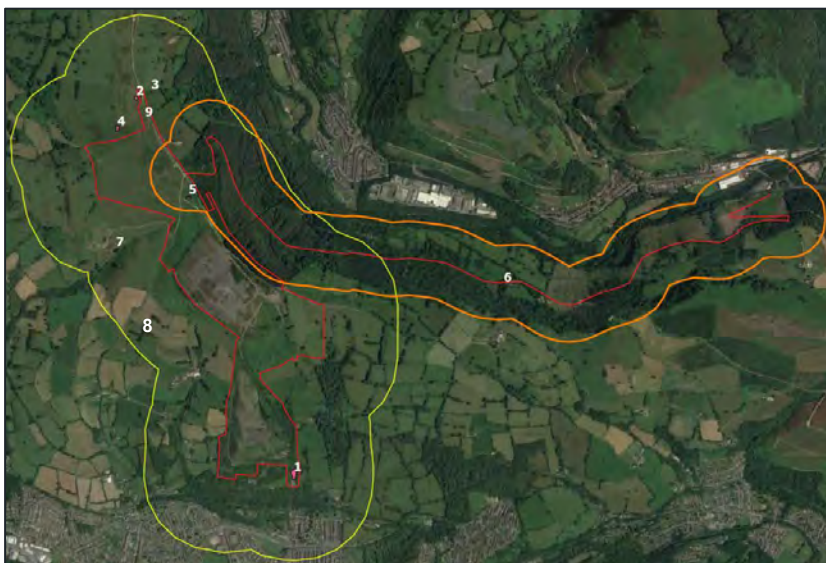
Review of the survey element of the PEA Report (WSP, 2023) revealed a number of waterbodies (ponds/ditches) within the Site. Several of the ponds were considered to have potential to support GCN.

A large quarry pond which was affected by quarrying at the time of the PEA survey was located to the south-eastern corner of the Lower tip. This pond was eDNA sampled in 2019 by Arbtech (SureScreen Scientifics, 2019). A negative result for GCN eDNA was returned.

The numerous ditches/drainage channels noted during the PEA survey were considered to have negligible potential for GCN, due to either being fed by fast flowing water during inclement weather creating a current, often shallow in nature and likely to dry up, and/or supporting limited aquatic vegetation to support GCN egg laying. These waterbodies were scoped out of HSI assessments.

### 5.2 HABITAT SUITABILITY INDEX

A location overview of ponds subject to HSI assessment is illustrated in Figure 5-1. Note that position 2 includes adjacent pond 2b.



**Figure 5-1 - Locations of ponds (pink polygons) assessed for habitat suitability within the 500m (yellow boundary) and 250m (orange boundary) survey areas.**



A general description of the waterbodies and summary of the HSI scores are provided in Table 5-1. The full HSI survey results are provided in Appendix A and supporting photographs provided in Appendix B.

**Table 5-1 – Summary of HSI Assessments.**

| Pond Ref. | Grid Ref.        | General Description   | Aquatic Species (Flora/Fauna)   | HSI Score | HSI Category |
|-----------|------------------|---|---|-----------|--------------|
| 1         | ST18120<br>89449 | Recently disturbed quarry pond – Approx. 20x35m <sup>2</sup> quarry pond that was surrounded to the north, west and eastern banks by a steep vertical rock face approximately 10-15m high. The southern bank of the pond comprised disturbed bare banks broken up by small patches of sapling trees (blackthorn ( <i>Prunus spinosa</i> ), bramble ( <i>Rubus fruticosus</i> agg.), alder ( <i>Alnus glutinosa</i> ), willow ( <i>Salix</i> sp.), birch ( <i>Betula</i> sp.), sparse bramble, buddleia and soft rush. No marginal/emergent/ floating vegetation for egg laying with exception of occasional bulrush. Water deep (estimated at 1-2m+). Water quality poor with milky appearance likely due to excavations to remove trapped sediment/silt from run-off captured from the tips (this was evident during two separate visits following dry and wet periods of weather). Inflow waterfall at northern bank with controlled outflow into stepped settling ponds – current quite strong following period of heavy rain. | Poor diversity<br><i>Flora</i> – None in water, occasional soft-rush ( <i>Juncus effusus</i> ) at bank edges. Emergent bulrush ( <i>Typha latifolia</i> ) noted in central bar during dryer weather.<br><i>Fauna</i> - 3 x mallards ( <i>Anas platyrhynchos</i> ) on water.   | 0.45      | Poor         |
| 2         | ST17051<br>91995 | Pond located in grazed marshy grassland. Marginal, emergent and submerged vegetation present. 0.5-1m depth. Good macrophyte cover. Relatively clear with small patches of biofilm. Shallow cattle poached banks. Dead sheep noted in very boggy poached margin of pond.   | Good diversity<br><i>Flora</i> – water crowfoot ( <i>Ranunculus</i> sp.), water-starwort species ( <i>Callitriche</i> sp.) abundant, floating sweet-grass ( <i>Glyceria fluitans</i> ), bulrush, pond algae and pondweed ( <i>Potamogeton</i> sp.)<br><i>Fauna</i> - common frog tadpoles and spawn ( <i>Rana temporaria</i> ), backswimmer ( <i>Notonecta</i> sp.), diving beetle, small water beetle, beetle larvae (note beetle species not identified), mayfly nymph, water fleas ( <i>Daphnia</i> sp.), mosquito larvae ( <i>Culex</i> sp.), leech (species not identified), pond skater ( <i>Gerris lacustris</i> ), wolf | 0.79      | Good         |

| Pond Ref. | Grid Ref.        | General Description   | Aquatic Species (Flora/Fauna)   | HSI Score | HSI Category  |
|-----------|------------------|---|---|-----------|---------------|
|           |                  |   | spider ( <i>Pardosa amentata</i> ).<br>Mallard.   |           |               |
| 2b        | ST17082<br>92014 | Pond located in grazed marshy grassland. Silty, 10-15cm max depth. Gentle sloping and partially cattle poached banks. Provided an overflow pond from Pond 2 with additional outflow via culvert down to Pond 3. Relatively clear water with small patches of biofilm. Deeper areas with moderate macrophyte coverage, transitioning to boggy marshy grassland in more extensive shallower areas.        | Moderate diversity<br><i>Flora</i> – water crowfoot, water-starwort, floating sweet-grass.<br><i>Fauna</i> – water fleas, diving beetle. Unviable frogspawn found.  | 0.58      | Below Average |
| 3         | ST17154<br>92037 | Ditch pond with inflow and outflow, connected to Ponds 2/2b. 15cm max depth. Clear water. Fairly steep banks. High macrophyte coverage. Some biofilm.   | Moderate diversity<br><i>Flora</i> - abundant floating sweet-grass, water-starwort, water crowfoot<br><i>Fauna</i> - abundant frog tadpoles, wolf spider, water fleas. Adult toad ( <i>Bufo bufo</i> ) found nearby in surrounding sheep grazed improved grassland.                           | 0.58      | Below Average |
| 4         | ST16924<br>91789 | Marshy grassland with area of standing water. Shallow 5-15cm depth, clear water. shallow banks with gentle gradient to marshy grassland.  | Moderate diversity<br><i>Flora</i> - water-plantain ( <i>Alisma</i> sp.), pond algae, water-starwort, floating sweet-grass.<br><i>Fauna</i> – wolf spiders, water fleas. Dead adult toad noted.   | 0.51      | Below Average |
| 5         | ST17407<br>91326 | Tyre rut ponds consisted of two very close, partially separated waterbodies (approx. 15m <sup>2</sup> each). 10-15cm depth, poached, silted, cloudy water. Banks had very shallow gradient to surrounding low grazed grassland vegetation with occasional soft rush at bankside. No emergent or floating vegetation.  | No diversity.<br><i>Flora &amp; Fauna</i> – None observed.  | 0.29      | Poor          |
| 6         | ST19543<br>90731 | Pond with dipping platform adjacent to Ynys Hywel Centre. Clear water, 70cm max depth, relatively shallow banks with grass vegetation. Hedge and trees/woodland nearby. Good macrophyte coverage. Pond subject to previous management - owners had undertaken vegetation thinning of pondweed and iris. Potential hibernacula i.e. small log piles noted in surrounding woodland and scrub. Surrounding | Good diversity<br><i>Flora</i> - water forget-me-not ( <i>Myosotis scorpioides</i> ), pondweed species, Nuttall's pondweed ( <i>Elodea nuttallii</i> ), broad-leaved pondweed ( <i>Potamogeton natans</i> ), soft rush, yellow flag iris ( <i>Iris pseudacorus</i> ) in and around waterbody. | 0.60      | Average       |



| Pond Ref. | Grid Ref.                     | General Description   | Aquatic Species (Flora/Fauna)   | HSI Score | HSI Category |
|-----------|-------------------------------|---|---|-----------|--------------|
|           |                               | habitat comprised open woodland, scrub with patches of grassland.   | <i>Fauna</i> - pond skaters, water snails, water boatmen ( <i>Corixa punctata</i> ), dragonfly nymph, damselfly nymph, wolf spider. Local volunteer informed of smooth newt ( <i>Lissotriton vulgaris</i> ) presence, common frog (incl. tadpoles). |           |              |
| 7         | ST16915 90972                 | Primary farm pond. Not accessible due to private land, steep banks.   | N/A   | N/A       | N/A          |
| 8         | ST16912 90959                 | Secondary farm pond. Not accessible due to private land. Not visible from distance.   | N/A   | N/A       | N/A          |
| 9         | ST 17111 91852 (largest pond) | Four small pools of standing water in grassland depressions. 10-40cm water, likely ephemeral following heavy rain in week prior to survey. Soft rush abundant in smaller, shallower pools (pools 2-4m <sup>2</sup> ). Larger pool (14m <sup>2</sup> ) had an absence of aquatic vegetation. Banks comprised grazed grassland. Soft-rush cuttings/pieces often densely covering water surface. | Low diversity<br><i>Flora</i> - Soft rush abundant in shallower pools.<br><i>Fauna</i> – only one small water beetle (species not identified) observed.   | 0.39      | Poor         |

## 5.3 ENVIRONMENTAL DNA (eDNA)

### 5.3.1 EDNA SAMPLING RESULTS

A summary of the results of the GCN eDNA sampling from the four ponds sampled is detailed in Table 5-2. The full ADAS eDNA Analysis Report is provided in Appendix C.

**Table 5-2 – Summary of eDNA results**

| Pond Ref. | eDNA Result |
|-----------|-------------|
| 2         | Positive    |
| 2b        | Negative    |
| 4         | Negative    |
| 6         | Negative    |

During the sampling process GCN eggs were identified within the adjacent Pond 2 and Pond 2b (see Appendix B –Photographs).

No GCN eggs were identified in the Ponds 4 and 6. Smooth/palmate newt eggs were recorded in Pond 6.

Locations of ponds surveyed, and ponds with confirmed GCN presence are illustrated on Drawing GC4277-WSP-74-XX-M2-L-3003.

### 5.3.2 INCIDENTAL RECORDS - OTHER AMPHIBIANS

During the HSI survey the following amphibian species (excluding GCN) were recorded:

- Pond 2/2b & 3 - An adult common toad was noted in a field adjacent east of Pond 3 (and within 50m east of Ponds 2/2b).
- Pond 2, 2b & 3 – Numerous frog tadpoles were noted within Ponds 2 & 3. Frog spawn also noted in Pond 2 and unviable frog spawn in 2B.
- Pond 4 – Dead adult toad noted.
- Pond 6 – Local resident informed that smooth/palmate newts and common frog present.

During an associated terrestrial invertebrate survey for the Scheme on 07 June 2023 two juvenile palmate newts (*Lissotriton helveticus*) were recorded under rocks adjacent to Ponds 2/2b (see Appendix B - Photographs).



## 6 DISCUSSION / INTERPRETATION OF RESULTS

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### 6.1 HABITAT SUITABILITY INDEX & EDNA SURVEY

Ponds assessed for habitat suitability (Figure 5-1 and Table 5-1) were largely considered to offer below average or poor suitability to support the presence of GCN due to a number of factors. These included:

- Lack of macrophyte and marginal vegetation for egg laying/shelter.
- Extensive shading.
- Poor water quality either clearly polluted or with low invertebrate diversity.

Pond 2 returned a positive sample for GCN eDNA and GCN eggs were identified during the sampling process. The results provide conclusive evidence that GCN are present and breeding in the pond.

Whilst Pond 2b returned a negative result for GCN eDNA, GCN eggs were identified during the sampling process. The pond is directly connected to Pond 2 via a shallow outflow, and it was considered highly unlikely for GCN to be absent from Pond 2b due to the confirmed breeding in Pond 2. The negative result highlights that, although a useful tool for surveying, caution is needed when relying on eDNA results alone to determine presence/absence.

Negative eDNA results were returned for Pond 4 and 6. The water level in Pond 4 was low, and the margins were heavily poached by cattle, and Pond 6 is 2.8km from ponds with confirmed GCN presence, making each sub-optimal for GCN. Additionally, no GCN eggs were identified in these ponds. This supports the negative eDNA results are robust and GCN are likely to be absent from these ponds.

The positive GCN results identified for Ponds 2/2b were expected due to the presence of previous desktop records for the species in Pond 2 alongside further records in ponds in the wider (1km) area north of the Site.

### 6.2 SUITABILITY OF HABITATS WITHIN THE SITE FOR GCN

Land within 500m of the ponds with GCN presence currently used for upland grazing was considered of low-moderate suitability to support commuting/overwintering GCN individuals. The more open grazed grassland area with low sward height or colliery spoil often offered little cover from predation, however areas dominated by rush and bracken offered increased suitability and cover. GCN was recorded in Ponds 2/2b. Marshy grassland and scrub between ponds in the wider area to the north outside the Site and Ponds 2/2b provide a degree of connectivity and MAGIC map searches (MAGIC, 2023) indicate a small farm pond lying 500-700m between each pond which may provide a stepping-stone between the ponds.

### 6.3 POTENTIAL IMPACTS TO GCN FROM THE SCHEME

In the absence of mitigation the following impacts may occur to GCN as a result of the Scheme:

#### 6.3.1 CONSTRUCTION/OPERATION

**Direct mortality or injury** - There is risk that vegetation clearance/excavations within 500m of Ponds 2/2b may cause accidental injury/killing or disturbance to GCN. A European Protected Species licence with an appropriate method statement for clearance works in these areas will be required from Natural Resources Wales.



**Terrestrial Habitat Loss** – Temporary (3-6 years) habitat loss within 500m of confirmed GCN ponds would occur to accommodate works (see Drawing GC4277-WSP-74-XX-M2-L-3003 for terrestrial zones around GCN confirmed ponds). This will be minimised where possible and restricted to areas around the existing track to the north-western extent of the Site and the proposed soil deposition area.

**Disturbance** – Construction/operational activities have the potential to cause negative impacts on GCN through disturbance (i.e. noise, vibration and lighting) and direct injury or mortality through vegetation clearance/excavations and/or timing of works coinciding with specific life cycle phases such as hibernation and breeding.

**Pollution** - In the absence of mitigation, pollution of habitats may occur as a result of construction/operational run-off, which could degrade habitats in use by GCN and detrimentally affect the GCN population at a local level in the long-term.

### 6.3.2 **POST-CONSTRUCTION (DE-COMMISSIONING) PHASE**

Landscaping and site remediation works may result in temporary disturbance as per construction/operational activities. A delay in vegetation regeneration following landscaping may also result in a temporary reduction in suitability of terrestrial habitat within the terrestrial zones of the confirmed GCN ponds. However, as the majority of the impacted habitat is located within the distant 250-500m terrestrial zone for GCN it is not considered that significant numbers of GCN would be using this zone and sufficient habitat exists in the wider area to support displaced individuals.

No long-term impacts are considered likely during the post-construction phase of the Scheme as the design is set to reinstate habitat to upland grazing post-works.

## 6.4 **OVERALL MAGNITUDE OF IMPACTS**

Impacts to GCN are largely confined to the construction/operational phases of the Scheme. These impacts can be mitigated via sensitive clearance measures, consideration of providing a suitable receptor area during ongoing works, pollution prevention measures and appropriate exclusion fencing. Providing the appropriate mitigation is implemented the overall magnitude of the construction/operational impacts to GCN from the Scheme would be minor adverse. The incorporated drainage system in the design should ensure run-off is directed into appropriate drainage channels and remove the risk of pollution run-off to surrounding habitat.

Should habitat reinstatement, alongside mitigation and enhancement measures such as wildlife ponds and brash pile/hibernacula creation, be incorporated into the design then a neutral to minor beneficial post-construction impact is anticipated in the long-term.



## 7 CONCLUSION

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Pond 2 (and adjacent 2b) located partially within and adjacent to the north-western extent of the Site were confirmed to support GCN (positive eDNA and eggs). Previous records for GCN had been identified in Pond 2 over the last 10 years. The terrestrial zone for GCN around ponds covers a 500m radius. GCN are likely to be present where the terrestrial zone (500m radius around ponds) falls within the Site.

Other ponds sampled for eDNA were negative for GCN. Additionally, no GCN eggs were identified in these ponds.

### Impacts to GCN

Parts of the Site lie within 500m of two ponds where GCN presence was confirmed, as such there is potential for GCN to be disturbed, injured or killed during the clearance phases of the Scheme. A European Protected Species Licence detailing an appropriate method statement for vegetation clearance and exclusion fencing, as detailed in Section 8, will be required to ensure impacts to GCN are negated/minimised. A suitable receptor site could be also considered to translocate individuals into during clearance phases. Providing these measures are implemented short-term construction/operational impacts to GCN are likely to be minor adverse.

In the Post-operational phase, the Scheme is set to be reinstated to upland grazing. Providing recommendations and enhancements outlined in Section 8 are incorporated into the Scheme, long-term impacts are likely to be minor adverse with potential to provide a minor beneficial long-term impact by increasing habitat diversity.

## 8 RECOMMENDATIONS

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### 8.1 EUROPEAN PROTECTED SPECIES LICENCE (EPSL)

An NRW European Protected Species development licence (EPSL) will be required **for all works within the 500m terrestrial dispersal zone of Ponds 2/2b (and by association Pond 3) inclusive of any impacted access tracks/roads for works**. This EPS licence will include an appropriate method statement for vegetation clearance and excavation works within the 500m pond zones.

### 8.2 EPSL - TRANSLOCATION AND VEGETATION CLEARANCE METHODS

The EPSL application will require the production of a detailed method statement prescribing how these activities would be achieved whilst ensuring 'no detriment to the maintenance of the favourable conservation status (FCS) of the species. This will include the exclusion of GCN from the Site within 500m of Ponds 2/2b (and Pond 3), and translocation of individuals to a chosen receptor site, maintenance of habitat connectivity, appropriate timings of works (clearance between April and October) and ecological supervision.

### 8.3 AMPHIBIAN FENCING

Amphibian fencing will be incorporated into the Scheme to exclude GCN, other amphibians and reptiles from the Site during the construction/operational phases of the works. Examples of fencing are included in Appendix D.

### 8.4 RECEPTOR AREA

A suitable receptor area could be considered and prepared in advance (minimum 1 year prior) of site clearance works. This area would provide a translocation area for GCN individuals captured during clearance phases as well as providing terrestrial habitat in lieu of temporary loss during the construction/operational works (5-6 year period). The receptor area should comprise a marshy grassland element that can be managed and improved prior to works. The receptor area should also be located away from livestock where possible, to prevent damage from poaching/overgrazing. The following enhancements could also be incorporated into the receptor area to improve the habitat for GCN:

#### 8.4.1 CREATION OF WATERBODIES

Mitigation to counter modified/temporarily lost habitat whilst works are ongoing (anticipated 5-6 years) could include the creation of a cluster of 3-4 small 25m<sup>2</sup> wildlife ponds within a suitable receptor area. These should be created in advance of the works (minimum 1 year prior) to allow this to establish in order to receive any GCN encountered during clearance phases and provide alternative habitat. Retention of these ponds in the post-construction/operational phase would provide a stepping-stone to other suitable waterbodies in the surrounding area, increasing connectivity and potentially increasing the size of the metapopulation. This would also benefit other species such as common amphibians, grass snake, bats and invertebrates.

#### 8.4.2 CREATION OF HIBERNACULA

In combination with the creation of ponds a hibernacula could be installed within the receptor area to provide additional shelter in lieu of temporarily lost terrestrial habitat whilst works are ongoing. Hibernacula are usually created by using a mixture of rubble, wood, soil and brash that would offer





shelter for GCN as well as other species of amphibian, reptiles and invertebrates. An example of hibernacula is included in Appendix E.

## **8.5 TOOLBOX TALK**

An ecological toolbox talk, covering GCN and amphibian identification, their ecology, legislative protection and actions to be taken if found, should be delivered to all site personnel by a suitably experienced ecologist.

## **8.6 BIOSECURITY MEASURES**

All work should follow ARG UK Advice Note 4 (Revised) Amphibian disease precautions: a guide for UK fieldworkers Version 2, revised March 2017, to prevent spread of diseases between amphibian populations. This will also be outlined in the EPSL.

The supervising ecologist will include biosecurity risks and required control measures in the toolbox talk.

## **8.7 RETENTION/CREATION OF GREAT CRESTED NEWT TERRESTRIAL HABITAT**

Woodland, scrub and grassland habitats within 500m of any pond with GCN presence will be retained as far as possible as part of the design to protect GCN during their terrestrial phase.

On completion of the works, and where possible, GCN habitat will be reinstated or left to revegetate naturally. This will benefit other species including birds, mammals, reptiles and common amphibian species.

## **8.8 POLLUTION PREVENTION**

Standard best practice and pollution control measures should be implemented in accordance with relevant guidance (e.g. CIRIA, 2001 and Environment Agency Guidelines for Pollution Prevention (GPP), particularly GPP 5) to ensure that suitable GCN terrestrial and aquatic habitats and the species they support (e.g. invertebrates) are not adversely affected by dust, uncontrolled surface water run-off, inappropriate storage of materials and inappropriate refuelling of machinery. These measures should be detailed in a Construction Environmental Management Plan (CEMP).

## **8.9 LIGHTING**

Any lighting required during both the construction and operational phases will need to be designed to avoid light spill into surrounding habitat to minimise the impacts on GCN. Should an EPSL be required then the Method Statement will also detail specifications.

## **8.10 ENHANCEMENT OPPORTUNITIES**

Planning Policy Wales, 2021, places a duty on developers to incorporate enhancements for wildlife as part of developments. Biodiversity Net Benefit (BNB) or Net Benefits for Biodiversity (NBB) is achieved where a development can demonstrate that it has maintained and enhanced biodiversity and created resilient ecological networks (CIEEM, 2022). Ecosystem resilience is referred to within the PPW (2021) and under Section 6 of the Environment (Wales) Act. The below recommendations could deliver BNB/NBB and allow the Proposed Scheme to comply with PPW, the Environment (Wales) Act 2016 and the Wellbeing of Future Generations (Wales) Act 2015 with respect to biodiversity. By engaging with these recommendations in the early stages of the Proposed Scheme, it is hoped that ecosystem resilience and wider ecosystem benefits can be achieved. This approach



would support local authorities in achieving their Section 6 duty to “promote the resilience of ecosystems” when determining planning applications.

To encourage compliance with planning policy the following measures for GCN are recommended for inclusion within the Proposed Scheme; where possible:

- **Creation of ponds and brash piles/hibernacula** in addition to those provided at the receptor site post-works will help improve the area for GCN in the long-term by providing further breeding and overwintering habitat.



## 9 REFERENCES

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- ARG UK (2017) *ARG UK: Advice Note 4 Amphibian Disease Precautions: A Guide for UK Fieldworkers Version 2, revised March 2017*. Amphibian and Reptile Groups of the United Kingdom.
- ARG UK (2010) *ARG UK: Advice Note 5 Great crested newt Habitat Suitability Index*. Amphibian and Reptile Groups of the United Kingdom.
- Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). *Analytical and methodological development for improved surveillance of the Great crested newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA*. Freshwater Habitats Trust, Oxford.
- CCB LBAP (2002) CCB Biodiversity Action Plan - Great Crested Newt Issue 1, Vol 2.
- CIEEM (2022) *Welsh Government's Approach to Net Benefits for Biodiversity and the DECCA Framework in the Terrestrial Planning System*. CIEEM Briefing Paper;
- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019
- Google Earth (2023)
- Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), *Great Crested Newt Conservation Handbook*
- Legacy (2001) *Newt Fencing*, Legacy Habitat Management Limited, Available at: <https://www.legacy-habitat.co.uk/newt-fencing.html>, [Accessed August 2023].
- Habitats Directive (1992) Council Directive 92/43/EEC
- JNCC (2023) 1166 Great crested newt *Triturus cristatus*, Available at: <https://sac.jncc.gov.uk/species/S1166/>, [Accessed February 2023]
- MAGIC (2023) pond search for HSI assessment
- Oldham, R.S.; Keeble, K.; Swan, M.J.S; and Jeffcote, M (2000) *Evaluating the suitability of habitat for the great crested newt (Triturus cristatus)*. *Herpetological Journal* 10(4), 143-155.
- Planning Policy Wales (2021) Edition 11
- South East Wales Biodiversity Records Centre (SEWBRc) (2022). Biodiversity Information Search –Bedwas Tips [Ref: 7000956].
- SureScreen Scientifics (2019) *Technical Report Analysis of Environmental DNA in Pond Water for the Detection of Great Crested Newts*, Folio No. E5816. Report date 10/07/2019.
- Wellbeing of Future Generations (Wales) Act 2015
- Welsh Government (2023) Open Letter (Ref: MA/JJ/2512/23) to Local Authorities – Heads of Planning
- Wildlife and Countryside Act 1981 (as amended).

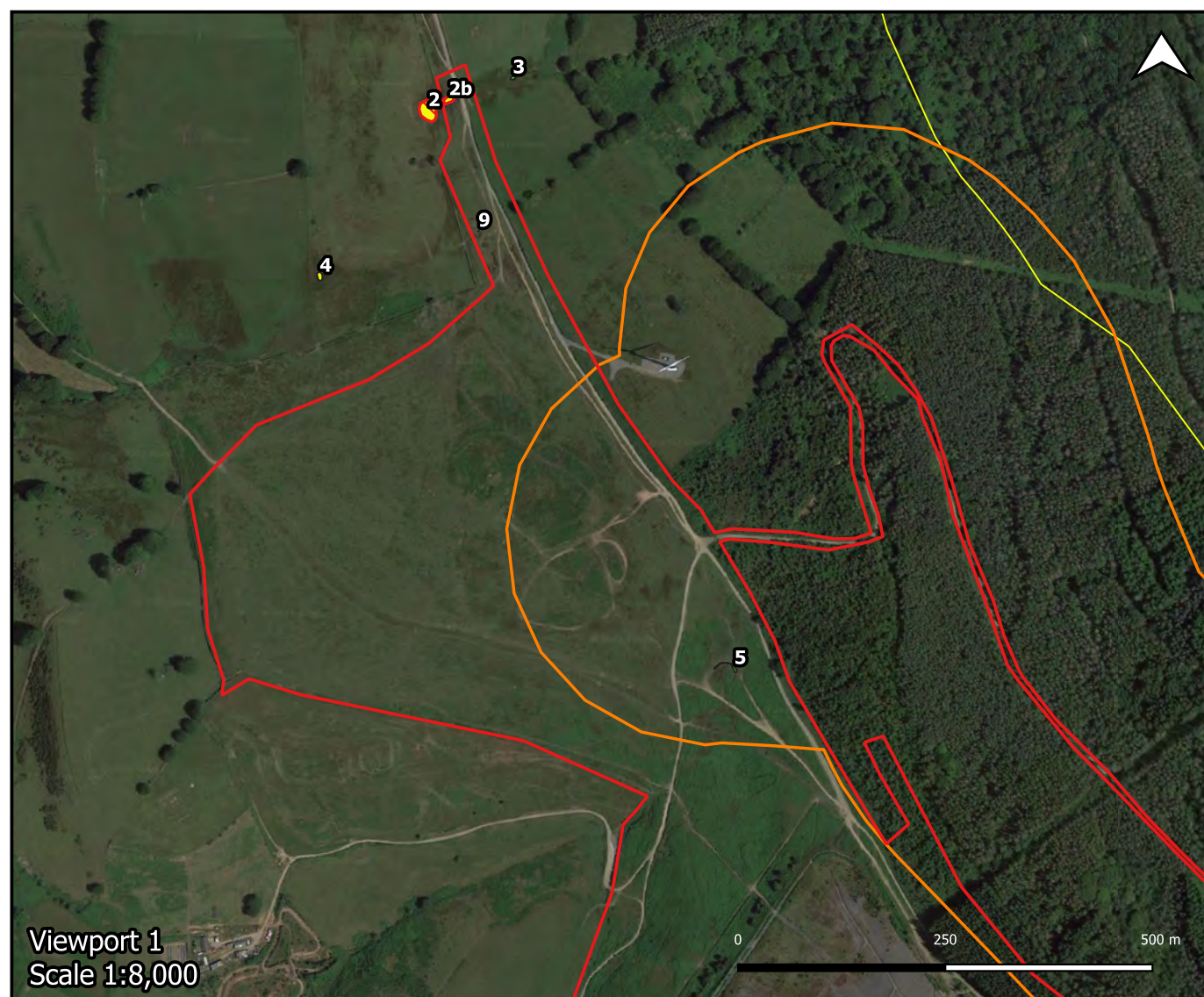


## DRAWINGS

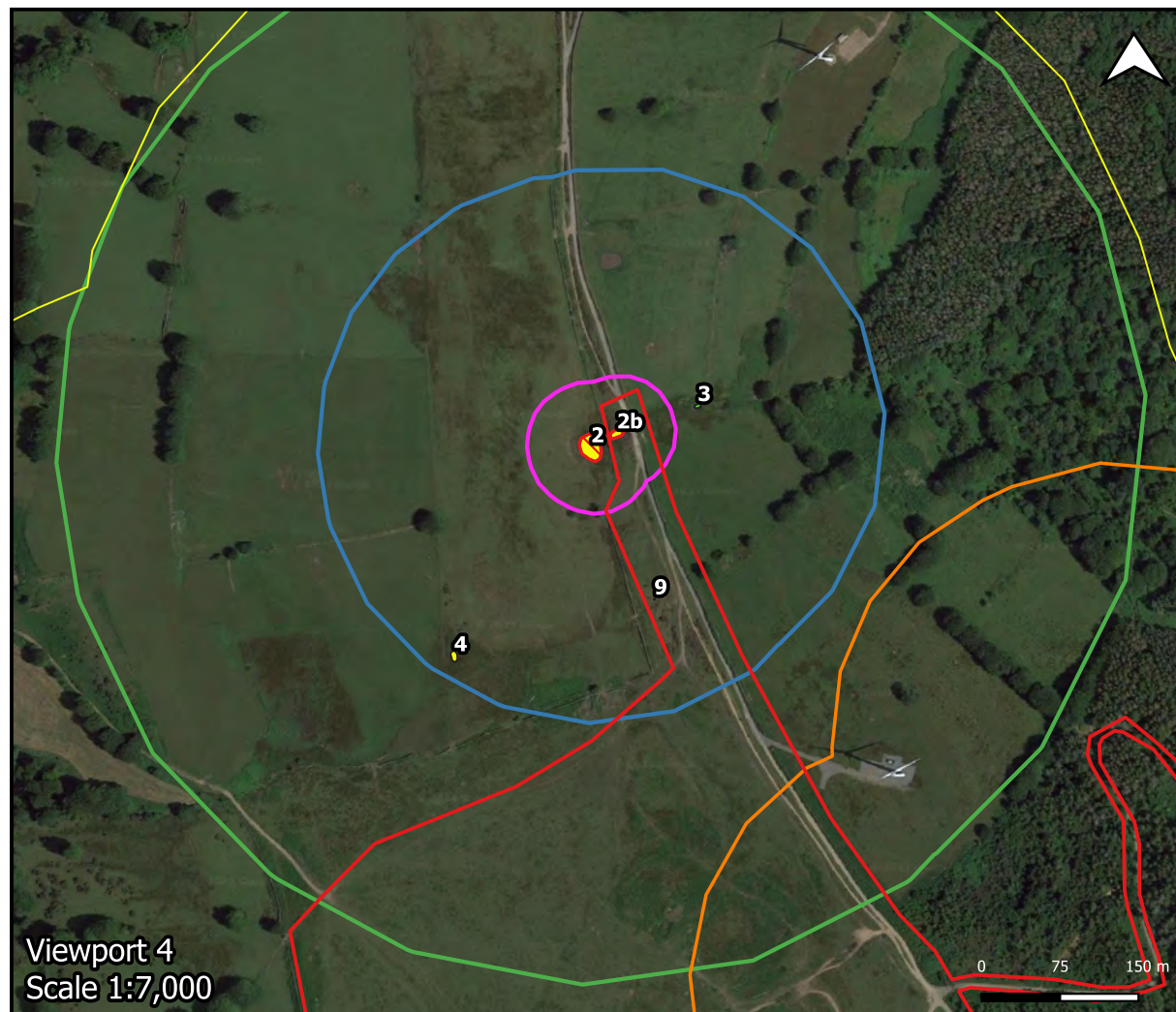
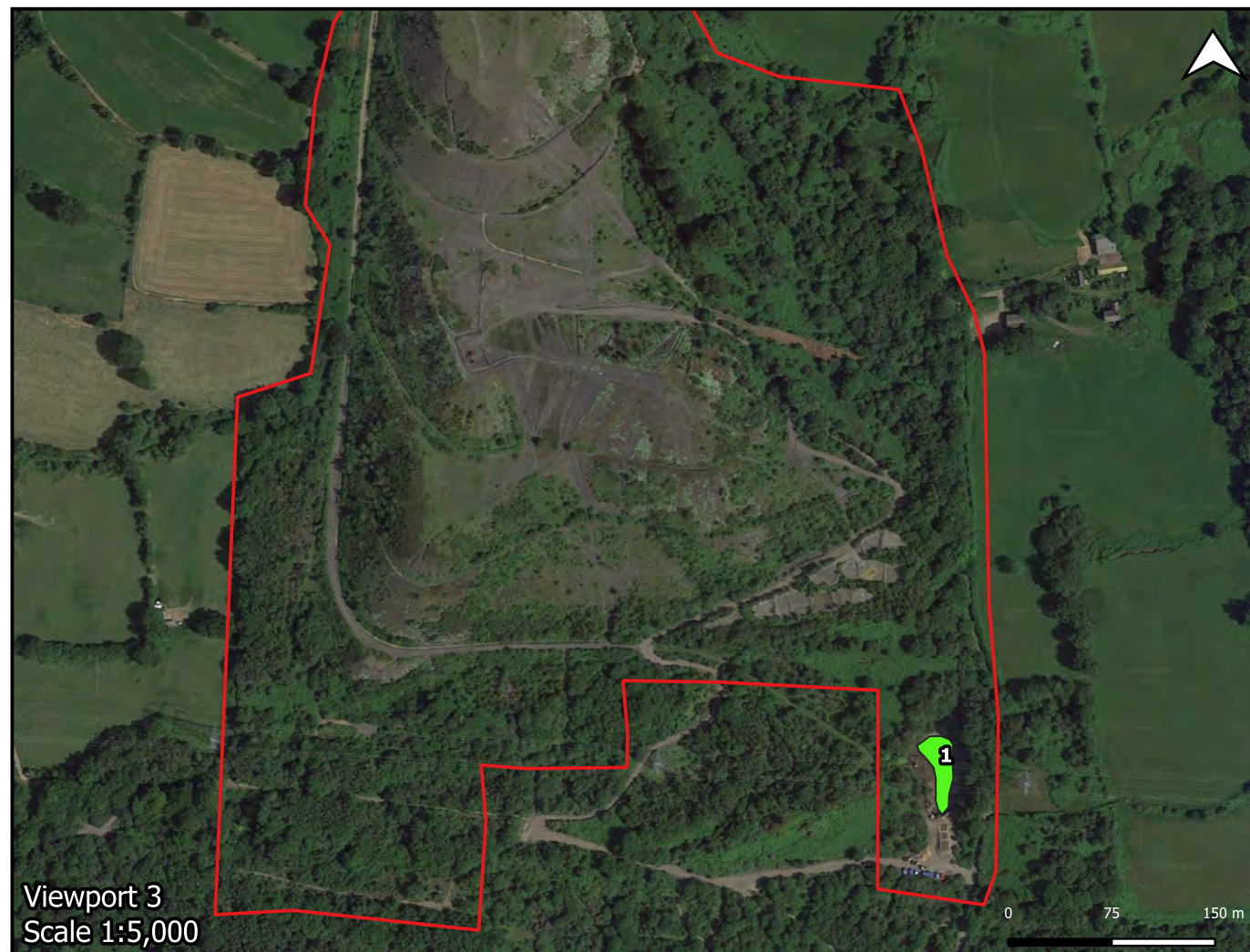
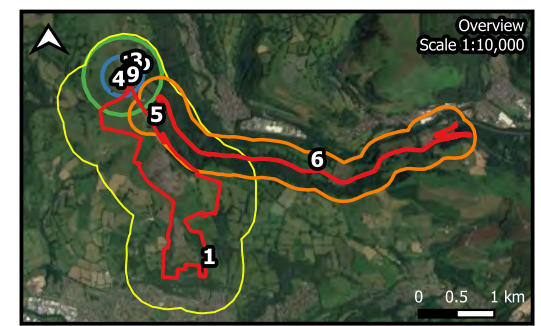
---

GC4277-WSP-74-XX-M2-L-3003 - Great Crested Newt Survey Results Map





- Key:
- Site Boundary
  - 250m Buffer (Hall Road)
  - 500m Buffer (Main Site)
  - GCN confirmed ponds
- Ponds scoped & surveyed:
- HSI
  - HSI & eDNA
- Terrestrial zones around GCN ponds:
- 50m core zone
  - 50-250m intermediate zone
  - 250-500m distant zone



|   |               |               |             |               |          |
|---|---------------|---------------|-------------|---------------|----------|
| P01   | EC            | TF            | RP          | First Issue.  | 13/12/23 |
| Rev Drwn  | Chk'd         | Appr'd        | Description | Date          |          |
| Purpose of issue  |               |               |             |               |          |
| S2 - Suitable for Information   |               |               |             |               |          |
| Classification  |               |               |             |               |          |
| Public  |               |               |             |               |          |
| Client  |               |               |             |               |          |
| Energy Recovery Investments Ltd   |               |               |             |               |          |
| Project   |               |               |             |               |          |
| Bedwas Tips Reclamation   |               |               |             |               |          |
| Drawing Title   |               |               |             |               |          |
| Great Crested Newt Survey Results   |               |               |             |               |          |
| Drawn   | EC            | Checked       | TF          | Approved      | RP       |
| Project No  | Date          | Scale         | Size        |               |          |
| GC/004277   | November 2023 | See Viewports | A3          |               |          |
| Drawing identifier  |               |               |             | Revision: P01 |          |
| GC4277-WSP-74-XX-M2-L-3003  |               |               |             |               |          |
|   |               |               |             |               |          |
| Quest House, St Mellons Business Park, Fortran Rd, St Mellons, Cardiff, CF3 0EY |               |               |             |               |          |



# Appendix A

## HSI SURVEY FOR GREAT CRESTED NEWT - RESULTS





**Table A-1 – HSI Results** (Annual= Annually; Some= Sometimes; Mod= Moderate; NA = Not Applicable; NK = Not Known)

| HSI Factor                          | Waterbody |          |               |               |               |          |         |      |      |          |
|-------------------------------------|-----------|----------|---------------|---------------|---------------|----------|---------|------|------|----------|
|                                     | 1         | 2        | 2b            | 3             | 4             | 5        | 6       | 7    | 8    | 9        |
| Geographical zone                   | B         | B        | B             | B             | B             | B        | B       | B    | B    | B        |
| Geographical score                  | 0.50      | 0.50     | 0.50          | 0.50          | 0.50          | 0.50     | 0.50    | 0.50 | 0.50 | 0.50     |
| Pond area m <sup>2</sup>            | 750       | 400      | 75            | 15            | 50            | 30       | 30      | 90   | 60   | 2-14     |
| Pond area score                     | 0.95      | 0.8      | 0.15          | 0.03          | 0.1           | 0.05     | 0.05    | 0.18 | 0.12 | 0.03     |
| Performance (drying) description    | Never     | Rarely   | Some          | Rarely        | Annual        | Annual   | Never   | NK   | NK   | Annual   |
| Performance score                   | 0.9       | 1.0      | 0.5           | 1.0           | 0.1           | 0.1      | 0.9     | NA   | NA   | 0.1      |
| Water quality category              | Bad       | Good     | Mod           | Mod           | Mod           | Bad      | Good    | NK   | NK   | Poor     |
| Water quality score                 | 0.01      | 1.0      | 0.67          | 0.67          | 0.67          | 0.01     | 0.67    | NA   | NA   | 0.33     |
| % Shade                             | 30        | 0        | 0             | <5            | 0             | 0        | 30      | 30   | NK   | 0        |
| Shade score                         | 1.0       | 1.0      | 1.0           | 1.0           | 1.0           | 1.0      | 1.0     | NA   | NA   | 1.0      |
| Waterfowl category                  | Minor     | Minor    | Absent        | Absent        | Minor         | Absent   | Minor   | NK   | NK   | Absent   |
| Waterfowl score                     | 0.67      | 0.67     | 1.0           | 1.0           | 0.67          | 1.0      | 0.67    | NA   | NA   | 1.0      |
| Fish category                       | Absent    | Absent   | Absent        | Absent        | Absent        | Absent   | Absent  | NK   | NK   | Absent   |
| Fish score                          | 1.0       | 1.0      | 1.0           | 1.0           | 1.0           | 1.0      | 1.0     | NA   | NA   | 1.0      |
| Pond count (add. ponds within 1 km) | 2         | 6        | 6             | 6             | 7             | 6        | 2       | 3    | 3    | 6        |
| Pond score                          | 0.55      | 0.80     | 0.80          | 0.80          | 0.85          | 0.80     | 0.55    | 0.65 | 0.65 | 0.80     |
| Terrestrial habitat category        | Mod       | Poor-Mod | Poor-Mod      | Poor-Mod      | Poor-Mod      | Poor-Mod | Good    | Mod  | Mod  | Poor-Mod |
| Terrestrial habitat score           | 0.67      | 0.67     | 0.67          | 0.67          | 0.67          | 0.67     | 1.0     | NA   | NA   | 0.67     |
| % Macrophyte cover                  | 0         | 30-40    | 5             | 95            | 70            | 0        | 80      | NK   | NK   | 0        |
| Macrophyte score                    | 0.3       | 0.65     | 0.3           | 0.85          | 1.0           | 0.3      | 1.0     | NA   | NA   | 0.3      |
| <b>Habitat Suitability Score</b>    | 0.45      | 0.79     | 0.58          | 0.58          | 0.51          | 0.29     | 0.60    | NA   | NA   | 0.39     |
| <b>Habitat Suitability Rating</b>   | Poor      | Good     | Below average | Below Average | Below average | Poor     | Average | NA   | NA   | Poor     |



# Appendix B








## PHOTOGRAPHS



**Table B-1 –Photographs.**

|   |  |
|---|--|
|   |  |
| <p>1. P1 showing milky water and steep rock face banks with waterfall inflow.</p>                 | <p>2. P1 view of water outflow into settling pools.</p>  |
|   |  |
| <p>3. P2 with emergent, marginal and submerged vegetation. Slightly cattle poached banks</p>      | <p>4. P2b adjacent to the access track to north and P2 to south. Cattle poached banks with some emergent, marginal and submerged vegetation.</p> |
|   |  |
| <p>5. P3, a ditch pond within grazed grassland with inflow from Ponds 2/2b and outflow ditch.</p> | <p>6. P4, a relatively shallow pond within grazed grassland and some emergent, marginal and submerged vegetation.</p>                            |



|  |  |
|--|--|
|   |    |
| <p>7. P5 a shallow pond created from heavy plant tyre ruts.</p>  | <p>8. P6 within the Ynys Hywel Centre with dipping platform.</p>                     |
|    |   |
| <p>9. P7 (P8 not visible) viewed from distance due to restricted access.</p>   | <p>10. The largest of the 4 ephemeral P9 ponds within grassland depressions.</p>     |
|   |  |
| <p>11. GCN Egg found in water crowfoot at Pond 2. (Note: Biosecurity measures such as thorough hand washing was implemented prior to each egg search).</p> | <p>12. GCN Egg found in float grass at Pond 2b.</p>                                  |
|   |  |
| <p>13. Juvenile palmate newt found under rock near Pond 2/2b.</p>  |  |

# Appendix C

## ADAS eDNA ANALYSIS REPORT RESULTS





| Pond Ref. | ADAS Pond Ref. |
|-----------|----------------|
| 2         | A              |
| 2B        | B              |
| 4         | C              |
| 6         | D              |

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Sample ID: ADAS-1629      Condition on Receipt: Low Sediment      Volume: Passed

Client Identifier: Pond D      Description: pond water samples in preservative

Date of Receipt: 11/05/2023      Material Tested: eDNA from pond water samples

| Determinant   | Result                 | Method        | Date of Analysis |
|---|------------------------|---------------|------------------|
| Inhibition Control <sup>†</sup>                                   | 2 of 2                 | Real Time PCR | 17/05/2023       |
| Degradation Control <sup>‡</sup>                                  | Within Limits          | Real Time PCR | 17/05/2023       |
| Great Crested Newt*   | 0 of 12 (GCN negative) | Real Time PCR | 17/05/2023       |
| Negative PCR Control (Nuclease Free Water)                        | 0 of 4                 | Real Time PCR | As above for GCN |
| Positive PCR Control (GCN DNA 10 <sup>4</sup> ng/μL) <sup>#</sup> | 4 of 4                 | Real Time PCR | As above for GCN |

Report Prepared by: Dr Helen Rees      Report Issued by: Dr Ben Maddison

Signed:       Signed: 

Position: Director: Biotechnology      Position: MD: Biotechnology

Date of preparation: 17/05/2023      Date of issue: 17/05/2023

*eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.*

*\* If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

*† Recorded as the number of positive replicate reactions at expected C<sub>t</sub> value. If the expected C<sub>t</sub> value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.*

*‡ No degradation is expected within time frame of kit preparation, sample collection and analysis.*

*#Additional positive controls (10<sup>4</sup>, 10<sup>2</sup>, 10<sup>3</sup> ng/μL) are also routinely run, results not shown here.*

ADAS eDNA Results Sheet: 1040055-ADAS-BEDWAS (01)

Page | 1 Edition: 01



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Sample ID: ADAS-1630      Condition on Receipt: Low Sediment      Volume: Passed  
Client Identifier: Pond B      Description: pond water samples in preservative  
Date of Receipt: 11/05/2023      Material Tested: eDNA from pond water samples

| Determinant  | Result                 | Method        | Date of Analysis |
|--|------------------------|---------------|------------------|
| Inhibition Control <sup>†</sup>                                    | 2 of 2                 | Real Time PCR | 15/05/2023       |
| Degradation Control <sup>‡</sup>                                   | Within Limits          | Real Time PCR | 15/05/2023       |
| Great Crested Newt <sup>†</sup>                                    | 0 of 12 (GCN negative) | Real Time PCR | 15/05/2023       |
| Negative PCR Control (Nuclease Free Water)                         | 0 of 4                 | Real Time PCR | As above for GCN |
| Positive PCR Control (GCN DNA 10 <sup>-4</sup> ng/μL) <sup>§</sup> | 4 of 4                 | Real Time PCR | As above for GCN |

Report Prepared by: Dr Helen Rees      Report Issued by: Dr Ben Maddison

Signed:      Signed:

Position: Director: Biotechnology      Position: MD: Biotechnology

Date of preparation: 17/05/2023      Date of issue: 17/05/2023

*eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.*

*\* If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

*† Recorded as the number of positive replicate reactions at expected C<sub>t</sub> value. If the expected C<sub>t</sub> value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.*

*‡ No degradation is expected within time frame of kit preparation, sample collection and analysis.*

*§ Additional positive controls (10<sup>-1</sup>, 10<sup>-2</sup>, 10<sup>-3</sup> ng/μL) are also routinely run, results not shown here.*





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Sample ID: ADAS-1631      Condition on Receipt: Low Sediment      Volume: Passed  
Client Identifier: Pond C      Description: pond water samples in preservative  
Date of Receipt: 11/05/2023      Material Tested: eDNA from pond water samples

| Determinant  | Result                 | Method        | Date of Analysis |
|--|------------------------|---------------|------------------|
| Inhibition Control <sup>†</sup>                                    | 0 of 2                 | Real Time PCR | 15/05/2023       |
| Degradation Control <sup>‡</sup>                                   | Within Limits          | Real Time PCR | 15/05/2023       |
| Great Crested Newt <sup>*</sup>                                    | 0 of 12 (GCN negative) | Real Time PCR | 15/05/2023       |
| Negative PCR Control (Nuclease Free Water)                         | 0 of 4                 | Real Time PCR | As above for GCN |
| Positive PCR Control (GCN DNA 10 <sup>-4</sup> ng/μL) <sup>‡</sup> | 4 of 4                 | Real Time PCR | As above for GCN |

Report Prepared by: Dr Helen Rees      Report Issued by: Dr Ben Maddison

Signed:       Signed: 

Position: Director: Biotechnology      Position: MD: Biotechnology

Date of preparation: 17/05/2023      Date of issue: 17/05/2023

*eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.*

*<sup>\*</sup> If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

*<sup>†</sup> Recorded as the number of positive replicate reactions at expected C<sub>t</sub> value. If the expected C<sub>t</sub> value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.*

*<sup>‡</sup> No degradation is expected within time frame of kit preparation, sample collection and analysis.*

*<sup>‡</sup> Additional positive controls (10<sup>-1</sup>, 10<sup>-2</sup>, 10<sup>-3</sup> ng/μL) are also routinely run, results not shown here.*



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Sample ID: ADAS-1632      Condition on Receipt: Low Sediment      Volume: Passed  
Client Identifier: Pond A      Description: pond water samples in preservative  
Date of Receipt: 11/05/2023      Material Tested: eDNA from pond water samples

| Determinant  | Result                 | Method        | Date of Analysis |
|--|------------------------|---------------|------------------|
| Inhibition Control <sup>†</sup>                                    | 2 of 2                 | Real Time PCR | 17/05/2023       |
| Degradation Control <sup>‡</sup>                                   | Within Limits          | Real Time PCR | 17/05/2023       |
| Great Crested Newt*  | 1 of 12 (GCN positive) | Real Time PCR | 17/05/2023       |
| Negative PCR Control (Nuclease Free Water)                         | 0 of 4                 | Real Time PCR | As above for GCN |
| Positive PCR Control (GCN DNA 10 <sup>-4</sup> ng/μL) <sup>‡</sup> | 4 of 4                 | Real Time PCR | As above for GCN |

Report Prepared by: Dr Helen Rees      Report Issued by: Dr Ben Maddison

Signed:

Signed:

Position: Director: Biotechnology      Position: MD: Biotechnology

Date of preparation: 17/05/2023      Date of issue: 17/05/2023

*eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.*

*\* If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

*† Recorded as the number of positive replicate reactions at expected C<sub>t</sub> value. If the expected C<sub>t</sub> value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.*

*‡ No degradation is expected within time frame of kit preparation, sample collection and analysis.*

*‡ Additional positive controls (10<sup>-4</sup>, 10<sup>-2</sup>, 10<sup>-3</sup> ng/μL) are also routinely run, results not shown here.*



## Appendix 1: Interpretation of results

### Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

### What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)

# Appendix D

## AMPHIBIAN FENCING EXAMPLES





Examples of Caudon® Newt Fencing (Legacy, 2023)

**Permanent newt fencing** is the ideal long-term solution for perimeter newt fencing on sites where there is movement of personnel, plant or other traffic.



**Semi-permanent newt fencing** still provides a very tough, damage resistant newt barrier but may prove to be more cost effective if a very long-term solution is not required.



**Temporary newt fencing** offers the most economical newt fencing solution for shorter term projects or where human disturbance is minimal.



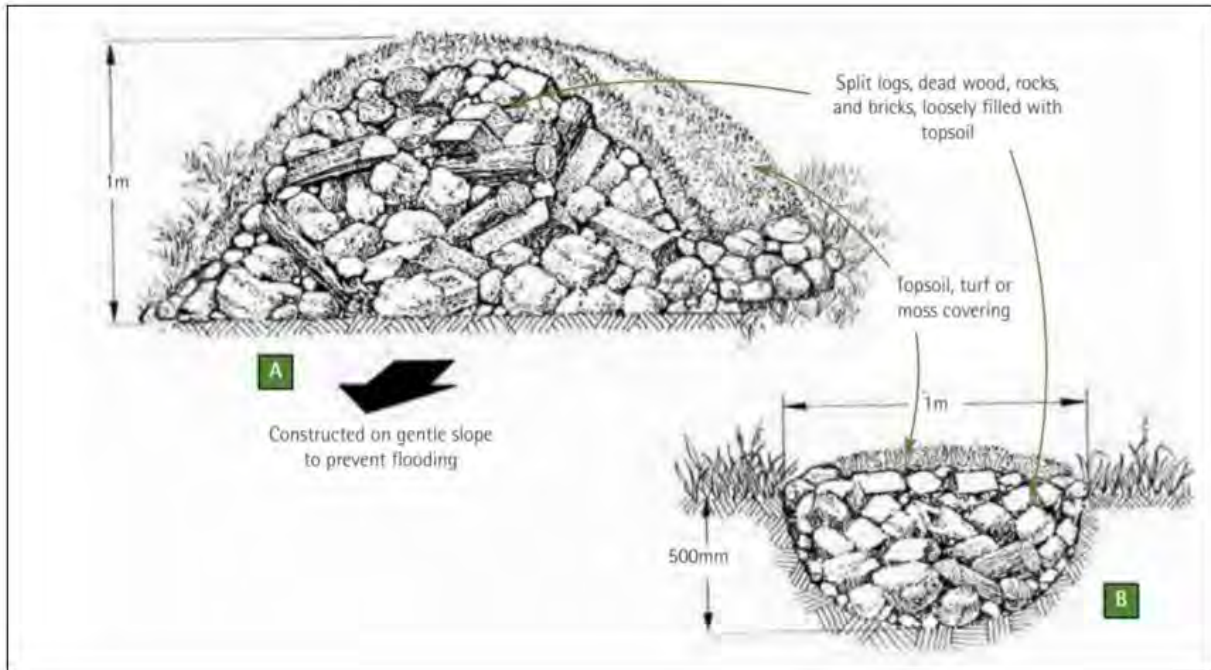
# Appendix E

## HIBERNACULA EXAMPLE





Great crested newt refuges on (A) impermeable and (B) free-draining soils (Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001)).





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CONFIDENTIAL

# V3-S09/0006

## BADGER SURVEY REPORT







Energy Recovery Investments Ltd

---

# BEDWAS TIPS RECLAMATION

## Badger Survey Report





Energy Recovery Investments Ltd

---

# **BEDWAS TIPS RECLAMATION**

## Badger Survey Report

**TYPE OF DOCUMENT (VERSION) CONFIDENTIAL**

**PROJECT NO. GC4277**

**OUR REF. NO. GC4277-WSP-74-XX-RP-L-0007**

**DATE: DECEMBER 2023**

WSP

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---



# QUALITY CONTROL

---

| Issue/revision | First issue   | Revision 1 | Revision 2 | Revision 3 |
|----------------|---|------------|------------|------------|
| Remarks        |   |            |            |            |
| Date           | 19 December 2023  |            |            |            |
| Prepared by    | Megan Watts (Ecologist)   |            |            |            |
| Signature      |    |            |            |            |
| Checked by     | Trevor Fletcher (Senior Ecologist)  |            |            |            |
| Signature      |    |            |            |            |
| Authorised by  | Geraint Pitman (Associate Director)   |            |            |            |
| Signature      |  |            |            |            |
| Project number | GC4277  |            |            |            |
| Report number  | GC4277-WSP-74-XX-RP-L-0007 – P01  |            |            |            |
| File reference | GC4277-WSP-74-XX-RP-L-0007  |            |            |            |





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## ***FIGURES***

Figure 1-1. The Scheme (red) and the Survey Area (yellow). Adapted from Google Earth, 2023.

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## ***DRAWINGS***

GC4277-WSP-74-XX-M2-L-3007 - BADGER SURVEY RESULTS MAP

---

## ***APPENDICES***

APPENDIX A

RELEVANT LEGISLATION AND PLANNING POLICY

APPENDIX B

PHOTOGRAPHS



# EXECUTIVE SUMMARY

WSP UK Ltd (WSP) was commissioned by Energy Recovery Investments Ltd to undertake a badger survey to accompany the planning application for the proposed Bedwas Tips Reclamation Scheme in Bedwas, Caerphilly Borough (Approximate Central Grid Reference: ST 17668 90526).

Two surveys were undertaken on 01 June 2023 and 21 September 2023.

Generally, the habitats within the proposed development, including coal tips and grasslands, offered limited suitability for badger, with habitats such as woodland and agricultural land located outside of the Scheme having greater potential for badger to establish setts.

One record for badger was returned via South East Wales Biodiversity Records Centre (SEWBRc) data searches within 1km of the Scheme.

Evidence of badger recorded during the surveys included latrines, hair, runs and snuffle marks. No setts were found during any of the surveys.

Evidence of badger was limited to the woodlands south and south-east of the Main Tip Site.

It is recommended that general badger mitigation measures are followed for the duration of the works to ensure there are no adverse impacts on the species.

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Contact details +44(0)7876356277 | Geraint.Pitman@wsp.com



# 1 INTRODUCTION

---

WSP was commissioned by Energy Recovery Investments Ltd to undertake a badger survey for the proposed Bedwas Tips Reclamation Scheme situated in Bedwas, Caerphilly Borough (Approximate Central Grid Reference: ST 17668 90526).

A badger survey was recommended to identify the potential level of impact from the proposed development on the species.

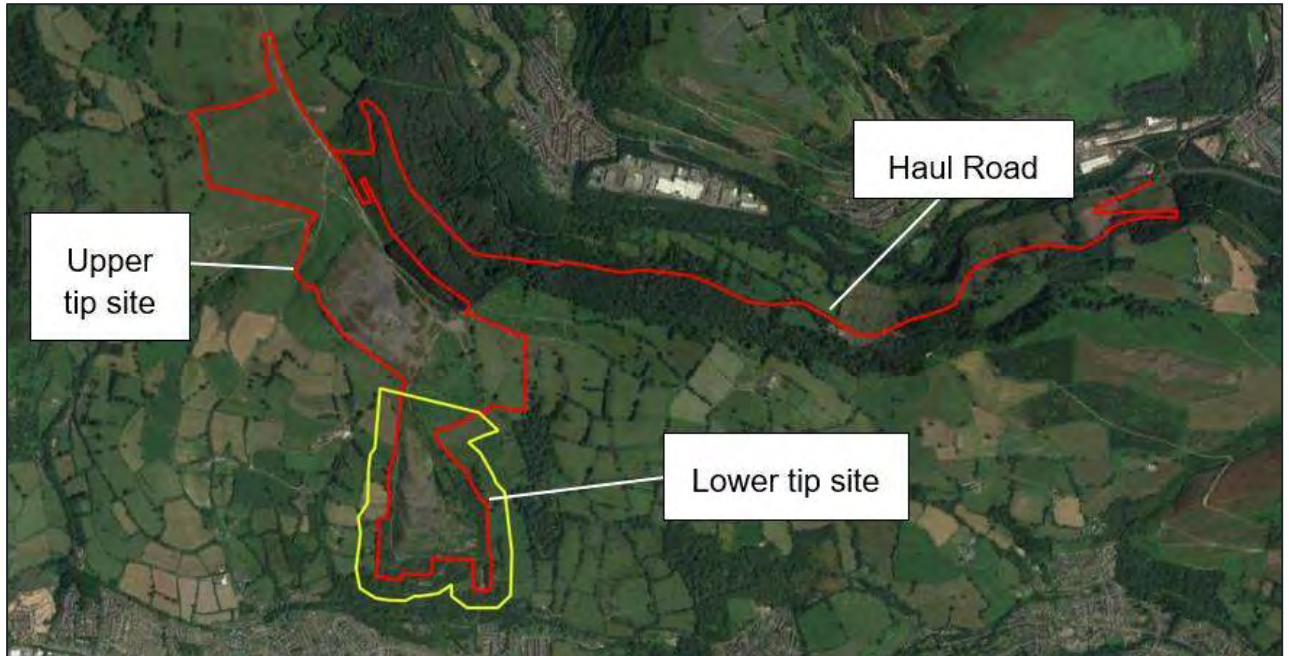
The objectives of the badger survey were to establish presence or absence of badger within the survey area, to identify any constraints that badgers may present to the proposed development and to identify whether further surveys/ mitigation measures are required.

This report includes details of the survey methodologies and results and contains recommendations for further survey, compensation/ mitigation measures and post-construction monitoring where needed.

Throughout the report the entire proposed development site will be described as “the Scheme.” The area surveyed for the badger survey will be described as “the Survey Area.” The Scheme and the Survey Area are shown in Figure 1-1.

The Scheme has been sub-divided into the ‘Haul Road’ and the ‘Main Tip Site’. The Main Tip Site is further divided into ‘Upper tip site’ and ‘Lower tip site’ as shown in Figure 1-1.

**Figure 1-1 – The Scheme (red) and the survey area (yellow). Adapted from Google Earth, 2023.**



## 1.1 GENERAL SCHEME DESCRIPTION

The Scheme is located approximately 1km north of Bedwas, Caerphilly County Borough and covers approximately 139ha including two existing coal tips on Mynydd y Grug and a track connecting the Upper tip site with the A467/B4251 roundabout.



Land use within the Scheme was predominantly sheep grazing fields across the two tip sites, whilst the proposed Haul Road was mainly located within forestry. Land use surrounding the tips consisted mainly of agricultural land, with the urban development of Bedwas town situated to the south. To the north-west of the Scheme area lay Mynydd y Grug Common, and to the north-east Cwmfelinfach village, separated by a large strip of woodland and the Sirhowy river, which ran roughly parallel with the Haul Road to the north. The Scheme lies partially within statutory and non-statutory designated sites.

## 1.2 PROPOSED WORKS

The proposed works are to restore the CCBC owned degraded and derelict land of the Bedwas coal spoil tips to a more natural habitat in keeping with the surrounding area. In the process, high ash coal will be extracted from the colliery spoil which will provide the means of funding the restoration. The land is to be suitable for upland grazing, thereby enhancing the natural environment and improving the resilience of ecosystems and ecological networks by:

- Re-landscaping in keeping with the natural character of the area
- Improving site drainage and run-off water quality
- Improving physical ground conditions and land stability
- Promoting soil recovery, revegetation, and enhanced biodiversity

The proposed development will operate over a period of approximately six years and will be conducted in the following stages:

- Construction of the following: access road, clean water pond, site bunding and water drainage channels, site water collection and treatment ponds, process plant, and portable buildings for workers.
- Excavation
- Deposition
- Reclamation
- Decommissioning
- Aftercare (5-year period)

## 2 BADGER ECOLOGY

---

The Eurasian badger (*Meles meles*), a member of the Mustelidae (the weasel and stoat family) is a widespread and common species in Britain but it is most numerous in the south and south-west of Britain.

Badgers live in social groups (sometimes known as 'clans'). A clan defends an area around their main sett known as a 'territory', the size of which depends on the local habitat, food availability, landscape features and local badger density. The size of a territory can range between 30 ha but are up to 150 ha in less productive habitats. Badgers mark setts, boundaries of territories and important feeding areas by defaecating in shallow pits called 'latrines'.

Badgers are nocturnal and spend long periods below ground in extensive systems of underground tunnels and nesting chambers known as 'setts'. Setts are commonly constructed in sloping ground but can also be established in flat ground, ditches, drainage pipes and under buildings. A number of setts of different sizes and functions may be found within the range of a single social group (Cresswell *et al*, 1990). Setts are routinely classified according to their size and the level of activity following the methodology of a national survey of badgers completed in the 1990s (Cresswell *et al*, 1990). The number of badgers within a social group can vary between three and 15, and so it is not possible to estimate numbers of badgers from the number of setts.

Badgers feed principally on invertebrates such as earthworms, beetles and wasps/bees (dug out from underground nests), but their diet can also include small mammals (such as mice, rats, voles and occasionally hedgehogs), birds and their eggs, carrion, cereals, fruit, leaves and fungi (Neal & Cheeseman 1996).

Not all groups of badgers have examples of each of the types of setts within their range. However, all social groups of badgers have just one main sett, and so by counting the number of main setts, it is possible to count the number of social groups of badgers present within an area.

Legislation related to badgers can be found in Appendix A.



## 3 METHODOLOGY

---

### 3.1 DESK STUDY

A request to the South East Wales Biological Records Centre (SEWBRc) was made for information on any ecologically designated sites, habitats and protected species (including badger) or species of conservation concern within a 1km radius (5km for bats) of the Scheme (SEWBRc, 2023). This included a request for data for priority habitats and species listed under Section 7 of the Environment (Wales) Act 2016.

### 3.2 HABITAT ASSESSMENT

The suitability of habitats within the Survey Area to provide opportunities for badger to establish setts and forage was initially based on findings of a Preliminary Ecological Appraisal (PEA) of the Site (WSP, 2023) and observations made while conducting subsequent species-specific surveys for the proposed Scheme. Further assessment was carried out during the field survey for badger.

### 3.3 FIELD SURVEY

Due to the size of the Scheme, the whole area was not surveyed. A sample area of the whole Scheme was chosen for the field survey. The Survey Area was selected as it was considered to represent habitat that combines the highest potential to support badger with the greatest likely disturbance/impact due to the proposed works. The survey area included the Main Tip Site and woodland to the south and south-east as shown in Figure 1-1.

In areas outside the Survey Area any signs of badger were noted as incidental records during other species-specific surveys.

Two badger surveys were undertaken in the Survey Area. The first survey was undertaken on 01 June 2023 by WSP Ecologists Megan Watts and Tara Okon. The second survey was undertaken on 21 September 2023 by WSP Ecologists Trevor Fletcher and Charlotte Gurney-Read.

Evidence of badger activity surveyed for included badger setts; badger pathways under fences and through vegetation; badger footprints; latrines and badger dung; badger hairs caught on wire; and signs of digging for food.

Locations of badger activity found during the field surveys are shown in Drawing 4277-WSP-74-XX-M2-L-3007 – Badger Survey Results Map. Unconfirmed badger runs were recorded as “Other” in the Survey Results Map. Photographs of badger activity are shown in Appendix B.

### 3.4 SURVEY CONSTRAINTS

Any ecological survey can only identify what was present on site at the time it was conducted, and habitat use by species can change over time. The length of time that the survey data remains valid will depend on a case-by-case basis, but it is generally considered that if the development or proposed works do not commence within two years of the date of this report an update may be required.

Due to the extensive area of the proposed Scheme the whole area was not surveyed. As habitat considered most likely to support badger activity within the Scheme was surveyed, and the high number of other species surveys carried out across the Scheme did not record signs of badger, it is considered that the conclusions drawn regarding badger in this report are robust.

## 4 RESULTS

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### 4.1 DESKTOP SURVEY

One record for badger (*Meles meles*) was returned from 1km data searches. This was for field signs of a badger seen on the side of the A468 road, approximately 680 m south-east of the south-eastern most point of the Scheme area.

### 4.2 HABITAT ASSESSMENT

The habitats surrounding the Haul Road were predominately conifer plantation and clear fell. These were considered to offer some suitability for setts, commuting and foraging badger.

The habitats around the Main Tip Site included coal spoil tips, grasslands and woodland. The coal spoil area had potential to support commuting and foraging badger, however, due to the unstable nature of spoil deposits the habitat was not suitable to support badger setts.

The grassland habitats within the Scheme were agricultural and grazed by livestock. The grasslands were considered to offer some suitability to support both commuting and foraging badger.

The woodland located south and south-east of the Lower Tip was broadleaved with scrub understory, it had suitability for badger to forage, commute and establish setts. The woodland to the south was regarded as having lower potential to support badger setts due to being frequently used by dog-walkers; the presence of dogs is likely to cause badger to avoid the area.

### 4.3 FIELD SURVEY

Locations of the results from the field surveys can be found in Drawing GC4277-WSP-74-X-M3-L-3007 – Badger Survey Results Map.

#### **Survey 1: 01 June 2023**

During Survey 1 evidence of badger was identified in the woodland located to the south-east of the Lower Tip. Evidence included latrines (see Photograph 1), snuffle marks (see Photograph 2) and badger hair found on a fence between an agricultural field and the woodland. Additionally, multiple possible badger runs were identified across the woodland.

No setts were found during Survey 1.

#### **Survey 2: 21 September 2023**

During Survey 2 the only evidence of badger was found in the woodland located south-east of the Lower Tip. There was less evidence of badger activity identified in this survey compared to Survey 1. The only evidence of badger activity identified in Survey 2 was possible runs, snuffle marks and a badger hair on a fence between an agricultural field and the woodland.

No setts were found during Survey 2.

#### **Incidental Results**

No evidence for the presence of badger was recorded outside the Survey Area within the Scheme.

A local resident communicated recent sightings of badger near the Ynys Hywel Activity Centre to surveyors during a great-crested newt survey on 04 April 2023, (pers. Comms., 2023)



During a dormouse survey undertaken on 29 September 2023 a badger latrine was identified within the woodland south-east of the Lower Tip in the Survey Area (see Photograph 3; approximate grid reference: ST 18084 89722).



## 5 DISCUSSION AND CONCLUSIONS

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Evidence of badger was generally found in the woodland located south-east of the Lower Tip. Badger signs included latrines, runs and hair caught on a fence. There was also a report of sightings of badger, made by a member of the public. No setts were discovered during any of the surveys.

The wider landscape, including agricultural grasslands and woodlands located east of the Main Tip, offered high potential for badger. Further west within the Scheme the habitats were not as suitable for badger due to loose substrate being less favourable for badgers to establish setts.

There is low likelihood of badger being impacted during the construction phase of the Haul Road connection to the B4251 and A467 roundabout. No signs of badger have been found within this area, however, the surrounding habitat is suitable for foraging and commuting badger.

Precautionary recommendations to ensure that the Scheme is compliant with current legislation relating to badgers are provided in Section 6.

## 6 RECOMMENDATIONS

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### 6.1 GENERAL BADGER MITIGATION

- It is recommended that, during construction, the use of external lighting should be kept to a minimum to reduce any potential disturbance to badgers which may be using the site.
- Night- time work should be avoided.
- Any excavations should be securely fenced off and covered over at the end of the working period, at weekends or when not in use to prevent badgers being trapped.
- The site compound should be fenced with badger proof fencing, which must be checked each day to ensure it remains intact.
- If a badger sett is found within 30m of the Scheme during any of the works, then work must stop and an ecologist notified.

## 7 REFERENCES

---

- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019
- Cresswell P., Harris S., & Jefferies D.J. (1990). The history, distribution, status and habitat requirements of the badger in Britain. Nature Conservancy Council, Peterborough.
- Conservation of Habitats and Species Regulations (2017)
- Google Earth (2022)
- Harris, S., Cresswell, P. and Jefferies, D. (1989) Surveying Badgers. Mammal Society: London
- Neal E. & Cheeseman C. (1996) Badgers. Poyser, London.
- Personal Communication (2023) Local resident informed WSP Ecologist, Emma Carney, of badger sightings nearby the Ynys Hwyl Centre, 4th April 2023.
- Protection of Badgers Act (1992).
- Scottish Natural Heritage (SNH) (2003) Best Practice Guidance - Badger Surveys. Inverness
- Badger Survey 2003. Commissioned Report No. 096.
- South East Wales Biodiversity Records Centre (SEWBReC) (2023). Biodiversity Information Search – Bedwas Tips [Ref: 7000956].
- WSP (2023) Bedwas Tips Ecological Appraisal (PEA) Report





# DRAWINGS

GC4277-WSP-74-XX-M2-L-3007 - Badger Survey Results Map



### Spring Survey Results

### Autumn Survey Results

- Key:**
- Redline Boundary
  - Survey Boundary
- Spring Survey Results:**
- Hair
  - Latrine
  - Snuffle marks
  - Other (potential run)
- Autumn Survey Results:**
- Hair
  - Snuffle marks
  - Other (potential run)



|     |      |       |        |              |            |
|-----|------|-------|--------|--------------|------------|
| P01 | NP   | MW    | GP     | First Issue. | 19/12/2023 |
| Rev | Drwn | Chk'd | Appr'd | Description  | Date       |

Purpose of issue  
S2 - Issued for Information

Classification  
Confidential

Client  
Energy Recovery Investments

Project  
Bedwas Tip

Drawing Title  
Badger Survey Results Map  
(Spring and Autumn Surveys)

|          |    |         |    |
|----------|----|---------|----|
| Drawn    | NP | Checked | TO |
| Approved | GP |         |    |

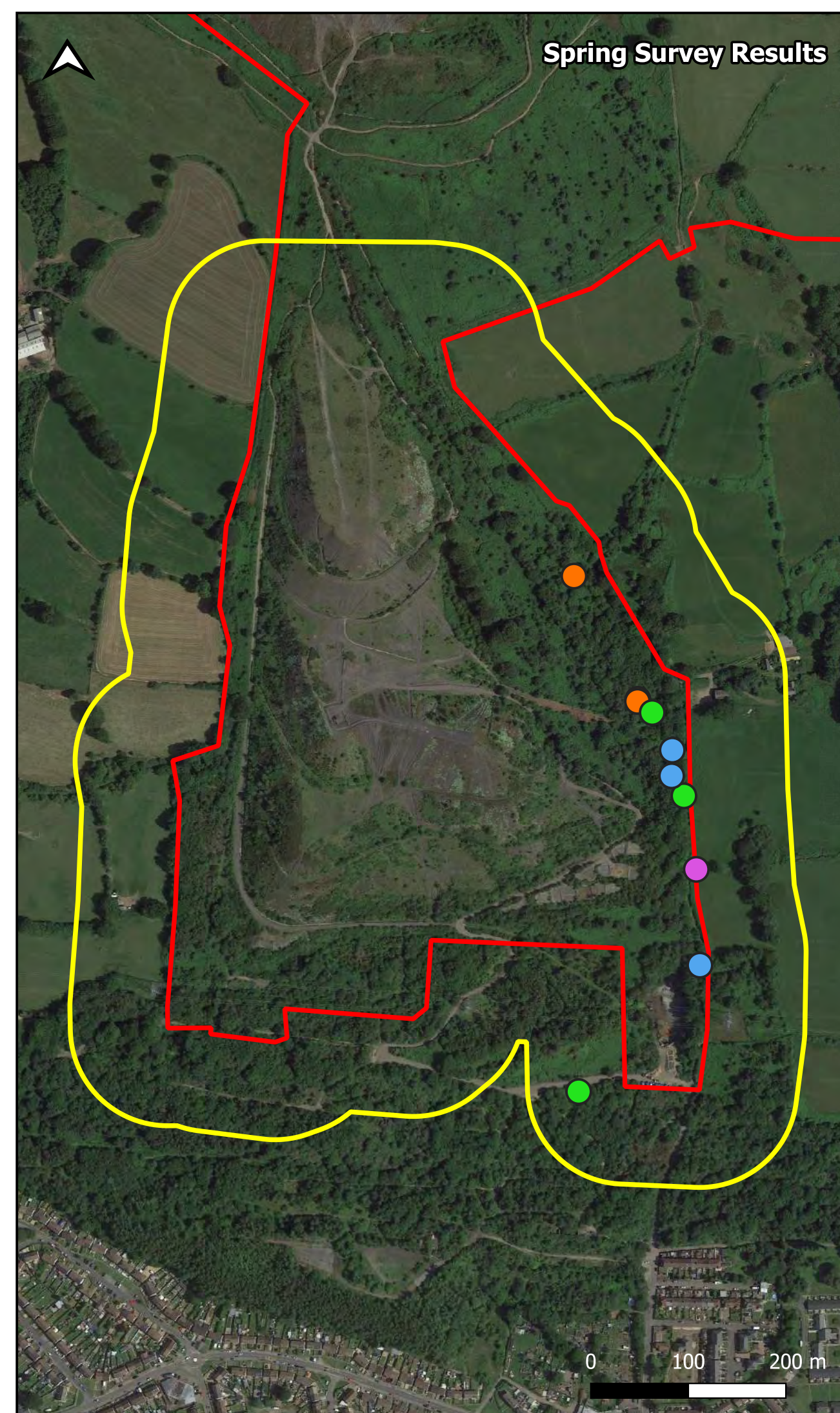
|            |              |         |      |
|------------|--------------|---------|------|
| Project No | Date         | Scale   | Size |
| GC/004277  | October 2023 | 1:5,000 | A3   |

Drawing identifier  
GC4277-WSP-74-XX-M2-L-3006

Revision: P01



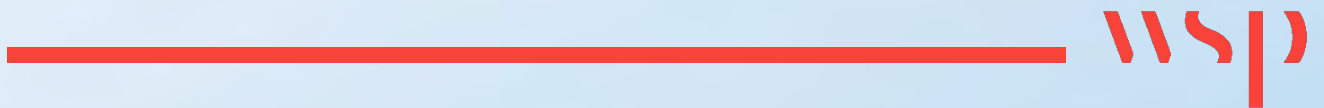
Quest House, St Mellons Business Park, Fortran Rd, St Mellons, Cardiff, CF3 0EY





# Appendix A

## **RELEVANT LEGISLATION AND PLANNING POLICY**







## BADGER

In Britain, badgers are protected under the Protection of Badgers Act 1992, a Consolidation Act which brought together the Badgers Acts of 1973 and 1991 and the Badgers (Further Protection) Act 1991. They are also covered by other, more general animal welfare laws. Under this range of legislation, amongst other things, it is illegal to:

- Intentionally kill, injure, take or cruelly ill-treat a badger.
- Attempt to destroy or damage an active badger sett or any part thereof.
- Obstruct access to an active sett or any of its entrance.
- Disturb a badger in a sett.
- Cause a dog to enter a badger sett.

Under the Protection of Badgers Act 1992 licences can be issued to carry out certain otherwise illegal operations at, or in the vicinity of, badger setts. The responsibility for issuing these licences in Wales rests with Natural Resources Wales (NRW).

Disturbance of a sett includes damaging or destroying, obstructing access to, and disturbing a badger whilst it is occupying a sett. It is not illegal, and therefore a licence is not required, to carry out disturbing activities in the vicinity of a sett if there is no disturbance to a badger and no damage or obstruction to the sett.

# Appendix B

## PHOTOGRAPHS



**Table B-1 – Badger Survey photographs.**

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|                                  |   |
| <p>3. Incidental record of latrine located at approximate grid reference: ST 18084 89722. Found on 29/09/2023.</p> |   |





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# V3-S09/0007

## **GROUND-NESTING BIRD & RAPTOR SURVEY REPORT**





Energy Recovery Investments Ltd

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# BEDWAS TIPS RECLAMATION

## Ground-nesting Bird and Raptor Surveys Report







Energy Recovery Investments Ltd

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## **BEDWAS TIPS RECLAMATION**

**TYPE OF DOCUMENT (VERSION) CONFIDENTIAL**

**PROJECT NO. GC4277**

**OUR REF. NO. GC4277-WSP-74-XX-RP-L-0006**

**DATE: DECEMBER 2023**

WSP

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# QUALITY CONTROL

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| Issue/revision | First issue   | Revision 1 | Revision 2 | Revision 3 |
|----------------|---|------------|------------|------------|
| Remarks        |   |            |            |            |
| Date           | 19 December 2023  |            |            |            |
| Prepared by    | Tara Okon (Ecologist)   |            |            |            |
| Signature      |    |            |            |            |
| Checked by     | Trevor Fletcher (Senior Ecologist)  |            |            |            |
| Signature      |    |            |            |            |
| Authorised by  | Geraint Pitman (Associate Director)   |            |            |            |
| Signature      |  |            |            |            |
| Project number | GC4277  |            |            |            |
| Report number  | GC4277-WSP-74-XX-RP-L-0006 – P01  |            |            |            |
| File reference | GC4277-WSP-74-XX-RP-L-0006  |            |            |            |



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PHOTOGRAPHS





# EXECUTIVE SUMMARY

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WSP UK Ltd (WSP) was commissioned by Energy Recovery Investments Ltd to undertake ground-nesting bird and bird of prey (raptor) surveys for the proposed Bedwas Tips Reclamation Scheme in Bedwas, Caerphilly Borough (Approximate Central Grid Reference: ST 17668 90526). These were to identify any constraints that ground-nesting birds and/or raptors may present to the Scheme. A total of 13 possible raptor nest sites were noted in a pre-breeding survey. Five raptor/owl species were recorded during evening Vantage Point surveys, including Schedule 1 species red kite and hobby. No evidence of raptor/owl breeding was recorded within the Scheme.

A total of 65 species of bird were recorded during the survey, including 11 breeding ground-nesting species comprising five confirmed breeding; three probably breeding; and three possibly breeding.

There were 60 breeding bird territories identified within the survey area. Breeding territories for nine species of high and/or medium conservation concern were recorded. The site overall is considered of local level importance in terms of nature conservation value for ground-nesting breeding birds.

Vegetation clearance and construction activities should avoid the bird breeding season (March to August inclusive). If not possible, ecological supervision of clearance works is required. Siting of plant, machinery, welfare facilities and access routes are to be determined following discussion with an ecologist to minimise impact on habitat suitable for breeding birds. In the unlikely event that Schedule 1 species goshawk is found to be nesting within 300m (if trees are being removed) or 500m (if no trees are being removed) of the Scheme a risk assessment would be required to determine the likelihood of birds being disturbed by the construction activities and to determine an appropriate exclusion zone. Pollution control measures must be in place to avoid contaminating water bodies. A toolbox talk will be delivered to all site operatives, raising awareness of potential breeding bird locations and suitable action should an active nest be found.

Post-operational phase, habitat such as open grassland should be replaced/reinstated using existing seedbank (top-soil re-use) where possible. Grazing should continue on Mynydd y Grug and woodland habitat should be replaced on a 2:1 basis with native tree species.

Post-operational phase ground-nesting bird surveys will be required (the timescales and survey frequency are likely to be stipulated as a planning condition).

Ecological enhancement opportunities include management of bracken on the open areas of Mynydd y Grug SINC to safeguard suitable nesting habitat for skylark; creation of additional wildlife ponds; and installation of kestrel and small bird species nest boxes.

**Contact name Geraint Pitman**

Contact details +44(0)7876356277 | Geraint.Pitman@wsp.com

# 1 INTRODUCTION

---

WSP UK Ltd was commissioned by Energy Recovery Investments Ltd to undertake ground-nesting bird and raptor surveys for the location of the proposed Bedwas Tips Reclamation Scheme ('the Scheme') in Bedwas, Caerphilly Borough (Approximate Central Grid Reference: ST 17668 90526).

The purpose of the surveys was to provide a preliminary overview of the diversity of ground-nesting bird and raptor species and their relative abundance to inform any constraints they may present to the proposed development.

This report includes details of the survey methodology and results and contains recommendations for further survey, compensation, mitigation measures and post-construction monitoring where required.

## 1.1 GENERAL SITE DESCRIPTION AND PROPOSED WORKS

The Scheme is located north of the villages of Bedwas and Trethomas, in Caerphilly County Borough Council (CCBC) district. It covers an extensive area (approximately 139ha) including two coal tips on Mynydd y Grug and a track connecting the northern tip site with the A467/B4251 roundabout.

Colliery spoil dominates the two tip sites while the track forming the proposed haul road is located largely within woodland habitats. Land use surrounding the tips comprises agricultural land with pockets of woodland. Cwmfelinfach village lies to the north-east, separated from the Scheme by the wooded corridor of the Sirhowy River which flows roughly parallel to the haul road. The Scheme lies partially within statutory and non-statutory designated sites.

The purpose of the works is to restore the CCBC owned degraded and derelict land of Bedwas coal spoil tips to a more natural habitat in keeping with the surrounding area. In the process, high ash content coal will be extracted from the colliery spoil which will provide the means of funding the restoration. The restored land is to be suitable for upland grazing, thereby enhancing the natural environment and improving the resilience of ecosystems and ecological networks by:

- Re-landscaping in keeping with the natural character of the area
- Improving site drainage and run-off water quality
- Improving physical ground conditions and land stability
- Promoting soil recovery, revegetation, and enhanced biodiversity

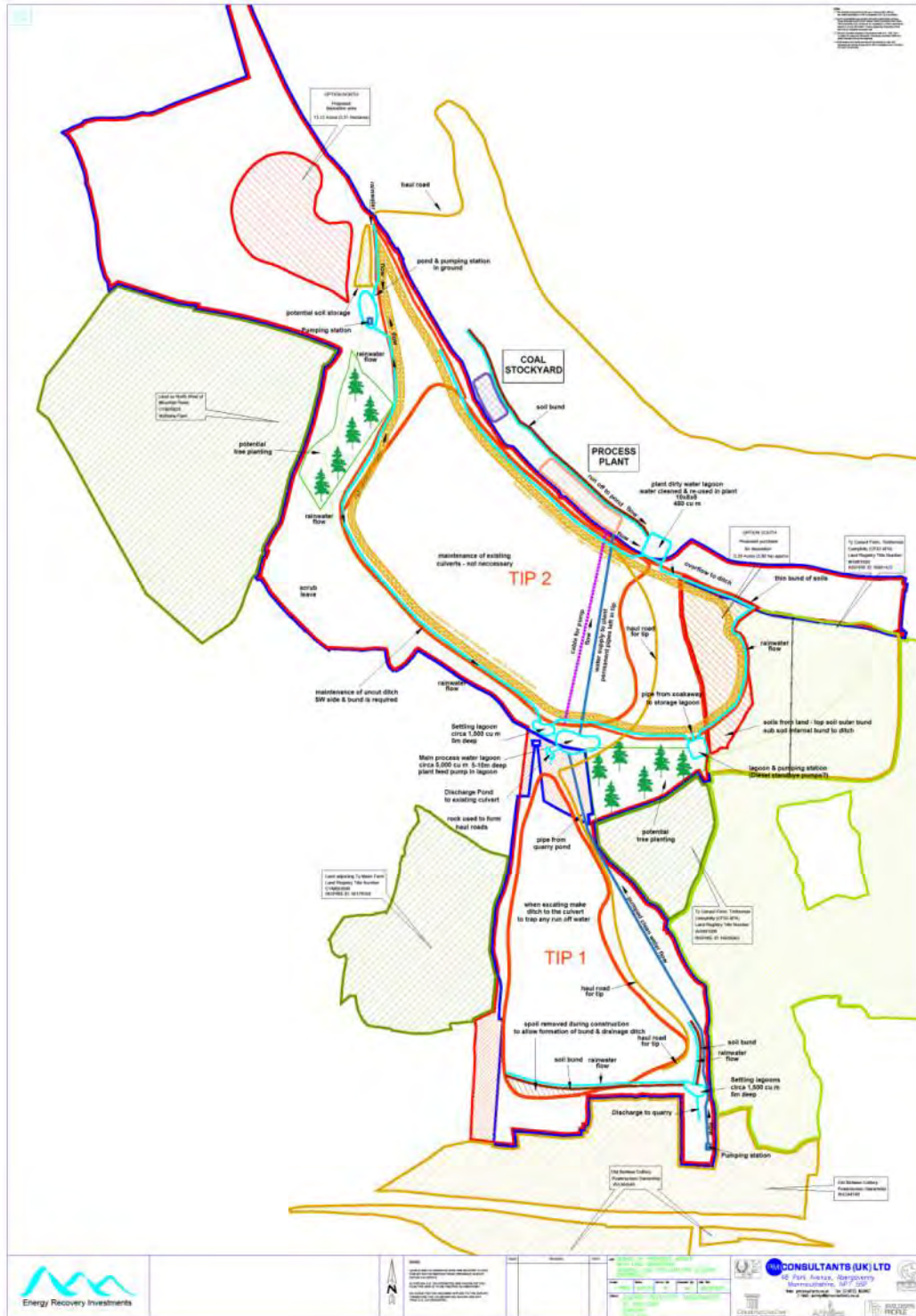
The general arrangement for the works, including the two tip sites and the haul road, is illustrated in Figures 1-1 and 1-2. The development will operate over a period of approximately six years and will be conducted in the following stages:

- Construction of an access road, clean water pond, site bunding and water drainage channels, site water collection and treatment ponds, process plant and portable buildings for workers.
- Excavation
- Deposition
- Reclamation
- Decommissioning
- Aftercare (5-year period)

The general arrangement for the works including the two tip sites (Tip 1 and Tip 2) and the haul road is illustrated in Figures 1-1 and 1-2.

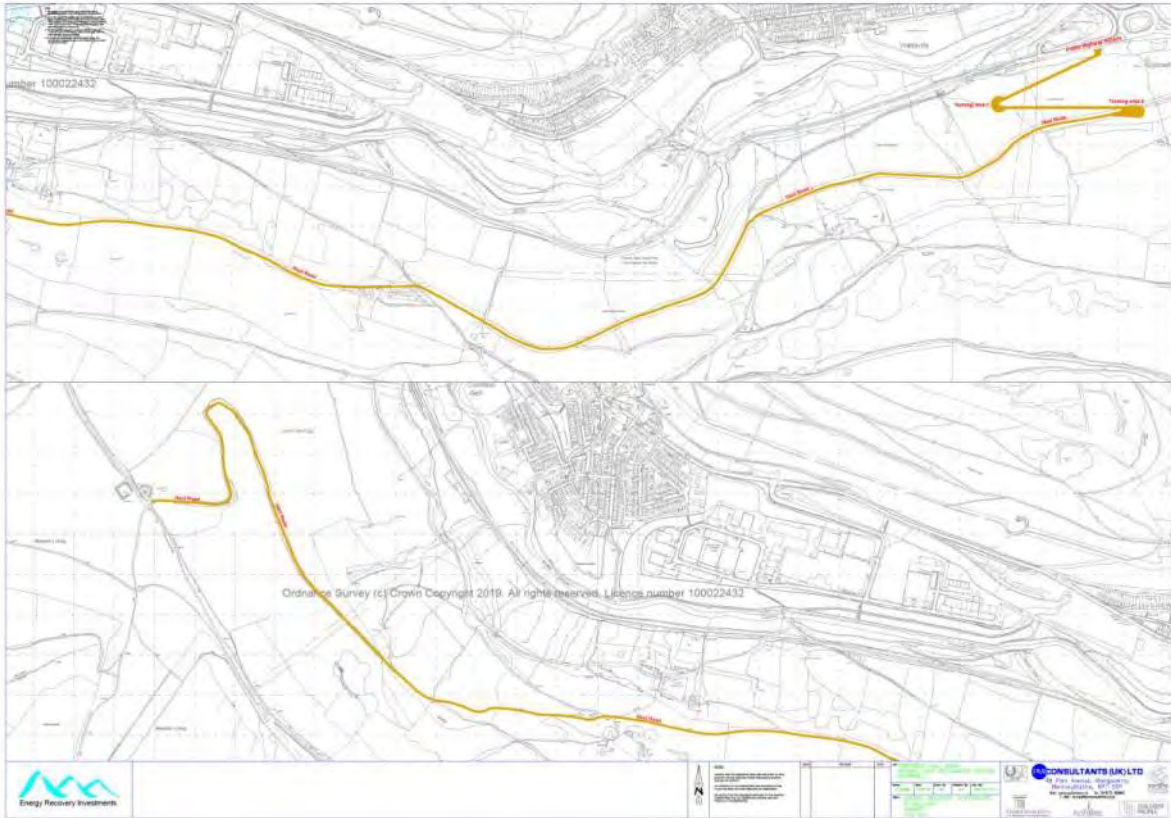
The location of the Scheme is illustrated in Figure 1-3. The Scheme has been further divided into the 'Haul Road' and the 'Main Site', the definition between which can be seen in Figure 1-3. The southerly tip site ('Tip 1'), and the northern tip site ('Tip 2').

**Figure 1-1 – Constructional and Operational Plan – Main Site**





**Figure 1-2 – Haul Road**



**Figure 1-3 - Scheme location. Red line indicates the Haul Road and red polygon the Main Site (approximate boundary of works area) (Adapted from Google Earth, 2023).**



## 2 METHODOLOGY

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### 2.1 DESK STUDY

The following resources were accessed for information regarding target species records and their distribution in the survey area for the Scheme.

- South East Wales Biodiversity Records Centre (SEWBRc, 2022)
- British Trust for Ornithology (BTO) Birdtrack [Accessed July 2023]
- The most recent national avifauna - The Birds of Wales (Venables *et.al.*, 2021)
- The most recent County avifauna - The Birds of Gwent (Venables *et.al.*, 2008)
- The most recent Gwent Ornithological Society Bird Report (GOS, 2019)

Aerial photographs and Ordnance Survey (OS) maps were reviewed to identify areas with potential for raptor and ground-nesting birds breeding, foraging and shelter sites.

Where third party data is referred to, for example from online searches and Biodiversity Record Centre data, WSP cannot be held responsible for the accuracy of the information.

### 2.2 FIELD SURVEYS

#### 2.2.1 PRE-BREEDING RAPTOR NEST SITE SURVEY

A pre-breeding raptor nest site survey was carried out on the 24, 25 and 26 January 2023.

Woodland and scattered trees located within 50m of the Haul Road were searched using high-powered binoculars for signs of previous nests with potential suitability for raptor species. Carrion crow nests were noted as these are often re-used by falcon species e.g., Schedule 1 hobby (Fergusson-Lees *et.al.*, 2011). Other evidence in the form of white splash from bird droppings on vegetation/trees under nest sites was also recorded.

#### 2.2.2 EVENING VANTAGE POINT (VP) SURVEYS

Survey methodology was adapted from industry standard guidance (Gilbert *et.al.*, 1998; SNH, 2017), applying guidance relating to raptors for survey duration, information recording, and VP locations to meet the specific aims of the survey.

A scoping visit was carried out on 14 March 2023 to determine the most suitable VP locations.

VP locations were selected to obtain maximum visual coverage of areas considered most likely to support raptor species within the Scheme using the minimum number of locations to achieve this aim. As such two VP locations were selected with an overview of woodland areas north-east of Tip 2 and south of Tip 1.

Survey effort was concentrated on woodland at the southern and northern extents of the Scheme as this habitat was considered to offer the most potential to support raptor species.

VPs are usually best located outside the Scheme where possible to minimise the observer's effect on bird behaviour. In this case, however, it was decided that points within the Scheme itself were appropriate. This was due to a lack of suitable breeding habitat for raptors at the tops of both Tip 2 and Tip 1. VPs overlooking woodland outside the Scheme were also considered to diminish the chances of detectability due to their distance from the Scheme.



The Tip 2 location was also selected as it provided a suitable VP to observe an area of clear fell, a suitable nesting habitat for nightjar (*Caprimulgus europaeus*) (Ferguson-Lees, J., *et al.*, 2011).

Surveyors located themselves in such a way as to remain as inconspicuous as possible to minimise any effect on bird behaviour or movement.

Three hours were spent at each evening VP location per “watch”. Surveyors scanned a 180 degree viewshed extending up to 2km from the VP location using binoculars.

During the VP survey the viewing arc was scanned constantly until a “target species” was detected. The flight of the bird was then followed until it landed or was lost from view. The following information was recorded for each target species on a standardised form:

- Species
- Time of observation
- Duration of observation
- Count (number of each species)
- Estimated flight height
- Direction of flight
- Estimated distance and direction of bird from the observer
- Flight type/behaviour, where apparent (e.g., foraging, displaying, commuting etc.)

VP locations and viewsheds are illustrated in GC4277-WSP-74-M2-L-3008.

Dates, times, and weather conditions during VP surveys are shown in Appendix A.

For the purpose of the VP survey “target species” were concentrated on, but not limited to, Priority/protected raptor species returned via SEWBRc data searches within 1km of the Scheme (see 3.3.1).

Information on non-target species was also recorded during the surveys.

Although no records were returned for barn owl (*Tyto alba*) they were considered a “target species.” Farmland/grassland habitats surrounding the Scheme were considered suitable to support the species and their nocturnal nature often means they are under-recorded.

Although not a raptor species, as surveys were taking place in the evening, the nocturnal ground-nesting species nightjar was also identified as a “target species” for evening VP surveys.

**Table 2-1 – Target species including raptors and nightjar**

| Common name | Scientific name              |
|-------------|------------------------------|
| Nightjar    | <i>Caprimulgus europaeus</i> |
| Goshawk     | <i>Accipiter gentilis</i>    |
| Red kite    | <i>Milvus milvus</i>         |
| Barn owl    | <i>Tyto alba</i>             |
| Kestrel     | <i>Falco tinnunculus</i>     |
| Hobby       | <i>Falco subbuteo</i>        |
| Peregrine   | <i>Falco peregrinus</i>      |



Four surveys were carried out in appropriate weather conditions between April and August 2023; avoiding days with high winds, heavy rain, or poor visibility, guarding against the possibility of under recording due to bird activity being suppressed.

Survey visits 1 (Tip 2), 2 and 4 (Tip 1) were carried out in the hours preceding sunset. Survey visit 3 (Tip 2) diverged from this timing and extended an hour after sunset to listen/scan for potential breeding nightjar and/or owls in the clear fell and surrounding area.

Surveys were completed by personnel with knowledge and experience of the likely raptor species assemblage for the geographical location and habitat types.

Opportunistic observations made during other ecological surveys within the Scheme were incorporated in the analysis where they provided pertinent additional information on species presence or breeding evidence.

### **2.2.3 DATA ANALYSIS – VANTAGE POINT SURVEYS**

Data gathered from evening VP surveys were collated (see Table 4-1) and flight activity was mapped (see Drawing GC4277-WSP-74-M2-L-3008).

### **2.2.4 GROUND-NESTING BIRD & DAYTIME RAPTOR SURVEYS**

A ground-nesting bird survey was undertaken using methodology broadly based on the British Trust for Ornithology's (BTO) Common Bird Census (CBC) (Bibby *et al.*, 2000; Gilbert *et al.*, 1998 and Marchant, 1983). This territory mapping method allows the distribution of ground-nesting bird territories across the Scheme to be determined. From this an estimate of the number of breeding pairs for each species can be derived. An advantage of this survey method is that it enables the relative importance of different areas of the Scheme to breeding birds to be evaluated.

A transect route was devised to ensure that there was particularly thorough survey coverage of areas likely to support ground-nesting birds. These included the grassland of Mynydd y Grug, north-west of Tip 2, as well as vegetated areas on/around Tip 1 and Tip 2 which were considered most likely to be affected by the Scheme.

This methodology diverges from CBC, which specifies recording to within 50m of the whole site as best practice, however it is considered that the methodology used would provide an accurate representation of the ground-nesting bird assemblage of the Scheme.

The transect route is illustrated in Drawing GC4277-WSP-74-XX-M2-L-3009.

Many common or abundant breeding bird species in Gwent are known to nest on, or near, the ground, either habitually or occasionally such as robin (*Erithacus rubecula*), blackbird (*Turdus merula*), dunnock (*Prunella modularis*), and song thrush (*Turdus philomelos*). Coal tit (*Periparus ater*), blue tit (*Cyanistes caeruleus*), and great tit (*Parus major*) may also nest within cavities in/on or near the ground. As such for the purpose of this report these species have been 'presumed breeding' within the Scheme.

Ground-nesting bird observations were therefore concentrated on, but not limited to, bird species listed in Table 2-2:

**Table 2-2 – Ground-nesting bird species**

| <b>Common name</b> | <b>Scientific name</b>        |
|--------------------|-------------------------------|
| Skylark            | <i>Alauda arvensis</i>        |
| Willow warbler     | <i>Phylloscopus trochilus</i> |
| Chiffchaff         | <i>Phylloscopus collybita</i> |
| Stonechat          | <i>Saxicola rubicola</i>      |
| Wheatear           | <i>Oenanthe oenanthe</i>      |
| Meadow pipit       | <i>Anthus pratensis</i>       |
| Tree pipit         | <i>Anthus trivialis</i>       |
| Reed bunting       | <i>Emberiza schoeniclus</i>   |

The transect route was walked on four separate occasions between April and July 2023 (full details of surveys can be found in Appendix A).

In accordance with CBC methodology surveys were conducted in the early morning, avoiding the hour before sunrise, and completed before noon.

During each visit the transect route was walked at a slow, steady pace to ensure birds could be detected by sight or sound. Frequent stops were made to scan for singing and calling birds.

Additional stops were made to scan for raptors with particular attention to signs of breeding activity such as territorial or courtship display.

Surveys were carried out in appropriate weather conditions; avoiding days with high winds, heavy rain, or poor visibility, guarding against the possibility of under recording due to bird activity being suppressed.

Surveys were completed by personnel with knowledge and experience of the likely species assemblage for the geographical location and habitat types.

All ground-nesting bird species and their locations were recorded using QField on a Samsung Galaxy Tab S7 using standard two-letter British Trust for Ornithology (BTO) codes. Bird activity was recorded using standard BTO behaviour codes.

All records of Schedule 1 bird species, regardless of breeding status, were mapped and the information used to supplement data recorded during evening VP surveys.

The criteria used in the assessment of breeding birds has been adapted from the standard criteria proposed by the European Ornithological Atlas Committee (EOAC 1979), as follows:

**Confirmed breeding** - Evidence of ground-nesting activity was observed, such as a nest containing eggs/young, distraction display/injury feigning observed, adults carrying food or where used nests or eggshells were located.

**Probable breeding** - A pair of birds in suitable ground-nesting habitat and displaying behaviours such as singing, breeding or alarm calls and were recorded from a similar area on more than one survey visit. These species were also considered to be holding permanent territories.

**Possible breeding** - A pair of bird species were noted in suitable ground-nesting habitat, or a single singing male was noted on only one survey visit.

**Non-breeding** - Species observed during the three surveys that were either flying over the survey area or displayed no signs of breeding or nesting, and for which the habitat is not considered suitable for nesting.

Opportunistic observations made during other ecological surveys within the survey area were noted and incorporated in the analysis where they provided pertinent additional information on species presence or breeding evidence.

## 2.2.5 DATA ANALYSIS – GROUND-NESTING BIRD SURVEYS

Territorial analysis was carried out based on a standard technique (Marchant, 1983; Bibby *et al.*, 2000) to determine the approximate location and number of ground-nesting bird territories within the survey area. A single map showing all indicative ground-nesting bird territories was produced from analysis of the four surveys (see Drawing GC4277-WSP-74-XX-M2-L-3009).

The conservation importance of the ground-nesting species recorded in the Scheme during the survey has been evaluated using two different approaches: conservation status and nature conservation value.

## 2.2.6 CONSERVATION STATUS

The ground-nesting bird species recorded in the Scheme were compared to published lists of species of conservation concern. These are birds listed in one or more of the following:

- Wildlife and Countryside Act 1981 (as amended) Schedule 1 (Statutorily protected species with additional protection against disturbance (S1));
- Environment (Wales) Act 2016 Section 7 (Species of ‘Principal importance (SPI) for the purpose of maintaining and enhancing biodiversity in relation to Wales);
- UK Red, Amber and Green List BoCC5 (Birds of Conservation Concern); and
- Wales Red, Amber and Green List- BoCCW4 (Birds of Conservation Concern in Wales).

Subsequently, each ground-nesting bird species identified as breeding during the survey was allocated a level of relative protection status/conservation concern based upon their statutory/non-statutory designation (outlined in Table 2-3). Further details of these legislation and conservation designations for birds are detailed in Appendix C.

**Table 2-3 – Classification levels for birds of conservation concern**

| Level of conservation concern/ protection status | Legislation                       |
|--|-----------------------------------|
| High   | S1/SPI/UK Red list/Wales Red list |
| Medium   | UK Amber list/Wales Amber list    |
| Low  | UK Green list/ Wales Green list   |

## 2.2.7 NATURE CONSERVATION VALUE

The Chartered Institute of Ecology and Environmental Management (CIEEM) guidance on Ecological Impact Assessment (CIEEM, 2018) assesses nature conservation value within a geographical context. To attain a particular value level a species population or assemblage of species should meet the criteria outlined in Appendix D.



The level of nature conservation value for a species was informed by the nature conservation status of each species and county level data taken from the most recently published Gwent Bird Report 2019 (Gwent Ornithological Society (GOS), 2021). Details for county level designations for species of high and medium conservation concern is shown in Appendix E.

Ground-nesting species recorded during the survey were compared to these criteria and assigned to the appropriate nature conservation value level.

An assessment of conservation status in combination with nature conservation value of a species/ species assemblage, together with spatial analysis of breeding territories across the Scheme enables evaluation of the likely impact of the development.

## 2.3 SURVEY CONSTRAINTS

A parcel of mixed woodland on the west side of surveyors' viewing arc on Tip 2 obscured part of the northern section of the site from view. There was potential for some raptor species flying low over trees surrounding the western extent of the Haul Road, north of Tip 2, to be missed during VP1 visits.

Detectability of target species declines with distance from the observer, this is particularly pertinent to smaller raptors that may hunt low over the ground (e.g., sparrowhawk and hobby).

The results of bird surveys can be affected by a variety of factors including season, weather, climate, migration patterns, food availability, and the presence of predators. Additionally, cryptic behaviour or lack of vocalisation may mean that birds that are present may be missed. The species list compiled for the Scheme may therefore be incomplete and the lack of evidence of a species does not necessarily preclude it from being present at another time. Given the similarity between the results of the survey and the desk study, it is considered that the assessment of the potential effects on breeding birds is accurate.

### 3 REVIEW OF PREVIOUS REPORTS/ DESK STUDY DATA

#### 3.1 DESIGNATED SITES

##### 3.1.1 STATUTORY DESIGNATED SITES

Two national statutory designated sites were located within 1km of the Scheme, both of which were Local Nature Reserves (LNR). These are described in Table 3-1.

Specific reference to birds within the citation or comment by the author of this report regarding birds is highlighted in **bold**.

**Table 3-1 – Statutory designated sites within 1km of the Scheme.**

| Site name       | Designation | Habitat type and bird species recorded  | Approximate distance and direction from Scheme |
|-----------------|-------------|---|--|
| Graig Goch      | LNR         | Ancient oak and beech woodland set in Sirhowy Valley Country Park.<br><b>Bird species recorded include redstart (<i>Phoenicurus phoenicurus</i>) and kingfisher (<i>Alcedo atthis</i>).</b>   | Haul Road passes directly through site         |
| Flatwood Meadow | LNR         | Two old hay meadows on banks of Sirhowy River some of few remaining examples of species-rich grasslands in Sirhowy Valley.<br><b>Birds recorded include grey heron (<i>Ardea cinerea</i>), kingfisher, and dipper (<i>Cinclus cinclus</i>).</b> | 170m north of Haul Road                        |

##### 3.1.2 NON-STATUTORY DESIGNATED SITES

Eighteen non-statutory designates sites were located within 1km of the Scheme, all of which were Sites of Importance for Nature Conservation (SINCs). Those most relevant to the Scheme are detailed in Table 3-2.

Specific reference to birds within the citation or comment by the author of this report regarding birds is highlighted in **bold**.

**Table 3-2 – Non-statutory sites within 250m of the Scheme.**

| Site name                               | Designation | Habitat type and bird species recorded  | Approximate distance and direction from Scheme                               |
|---|-------------|---|--|
| Mynydd y Grug, West of Cwmfelinfach     | SINC        | Acid grasslands, marsh and ponds.<br><b>Bird species recorded include skylark, meadow pipit, stonechat, wheatear and linnet (<i>Linaria cannabina</i>).</b> | Scheme (Tip 2 site and large area to north-west) sits partially within SINC. |
| Mynydd Bach Slopes, East of Llanbradach | SINC        | Mix of broadleaved woodland, marshy grassland, semi-improved acid grassland, bracken and scrub. Includes ancient woodland and some wet woodland.            | West of northern area of Main Site (immediately west of Mynydd y Grug SINC)  |

|  |      |   |   |
|--|------|---|---|
|  |      | <b>Bird species recorded include buzzard (<i>Buteo buteo</i>), skylark, wheatear, meadow pipit, redstart, and willow warbler.</b>   |   |
| Twyn yr Oerfel, South of Cwmfelinfach      | SINC | North-facing slope making up part of Mynydd y Grug Common comprises mainly bracken and acid grassland with scattered scrub. Includes flush and pond.<br><b>Birds recorded include skylark, yellowhammer (<i>Emberiza citronella</i>), meadow pipit, wheatear, stonechat, cuckoo (<i>Cuculus canorus</i>), and willow warbler.</b> | North-eastern area of Main Site sits partially within SINC. |
| Berth Goch Wood, North of Trethomas        | SINC | Ancient woodland with canopy of mature oak. Heavily sheep and cattle grazed.<br><b>Birds recorded include green woodpecker (<i>Picus viridis</i>), skylark, meadow pipit, redstart, willow warbler, chiffchaff, cuckoo, stonechat, blackcap (<i>Sylvia atricapilla</i>), and coal tit (<i>Periparus ater</i>).</b>                | 45m east of Main Site                                       |
| River Sirhowy                              | SINC | River Sirhowy and adjacent semi-natural habitats.<br><b>Birds recorded include dipper, buzzard, cuckoo, pied flycatcher (<i>Ficedula hypoleuca</i>), crossbill (<i>Loxia curvirostra</i>), and grey wagtail (<i>Motacilla cinerea</i>).</b>   | 70 m north (Haul Road)                                      |
| Graig y Prisiad Woodlands, Ynysddu         | SINC | Mainly replanted, former ancient woodland including indicator species. Fields including acid grassland, bracken and mature beech ( <i>Fagus sylvatica</i> ). <b>Birds recorded include buzzard, chiffchaff, willow warbler, and redstart.</b>   | 100m north (Haul Road – western extent)                     |
| Mynydd Machen, West of Rlsc                | SINC | Sheep grazed common, covered mainly by bracken, acid grassland and heath.<br><b>Birds recorded include buzzard, meadow pipit, raven (<i>Corvus corax</i>), stonechat, and linnet.</b>   | 110m south (Haul Road – eastern extent)                     |
| Sirhowy Country Park Meadows, Cwmfelinfach | SINC | Land adjacent to River Sirhowy edge, supporting grassland and scrub habitats. Also contains two ponds.<br><b>Birds recorded include buzzard, mallard (<i>Anas platyrhynchos</i>), and grey wagtail.</b>   | 220m north (Haul Road)                                      |



## 3.2 HABITATS

The Phase 1 habitat survey (WSP, 2023) included a range of habitats suitable to support a wide diversity of invertebrate species in terms of foraging, sheltering, and breeding. Main habitats included extensive areas of colliery spoil; marshy grassland; continuous bracken; dense scrub; acid heathland, dry dwarf shrub heath (acid), and lichen/bryophyte heath mosaic; plantation, broadleaved and felled woodland; as well as ponds. For photographs of examples of the habitats present see Appendix G and for further details relating to habitats within the Scheme refer to Bedwas Tips Reclamation: Preliminary Ecological Appraisal (PEA) Report (WSP, 2023).

## 3.3 PRIORITY AND PROTECTED BIRD SPECIES

Appendix F lists bird species that have additional protection under the Wildlife and Countryside Act 1981 (as amended) and/or are considered Priority species under the Environment (Wales) Act 2016. Non-statutory designations are also listed where they are species of high and/or medium conservation concern. The list shows records from within a 1km radius of the site within the last 10 years. A summary of the records is detailed as follows:

### 3.3.1 PRIORITY/PROTECTED/RED LISTED BIRD SPECIES

A total of 578 records for 27 protected/Priority bird species were returned from 1km data searches, including 10 Schedule 1 Wildlife and Countryside Act (WCA) 1981 (as amended) species, and 17 Section 7 (S7) Environment (Wales) Act 2016 listed species.

Schedule 1 species comprised brambling (*Fringilla montifringilla*), crossbill, firecrest (*Regulus ignicapilla*), goshawk, fieldfare (*Turdus pilaris*), hobby, kingfisher, peregrine, red kite, and redwing (*Turdus iliacus*).

Section 7 species comprised bullfinch (*Pyrrhula pyrrhula*), cuckoo, dunnoek (*Prunella modularis*), herring gull (*Larus argentatus*), house sparrow (*Passer domesticus*), kestrel, lesser redpoll (*Acanthis cabaret*), linnets, nightjar, pied flycatcher, reed bunting, skylark, song thrush, spotted flycatcher (*Muscicapa striata*), starling (*Sturnus vulgaris*), tree pipit, and wood warbler (*Phylloscopus sibilatrix*).

A total of 224 records returned were for species listed on the UK and/or Wales Red list. UK Red list (BoCC5) species included greenfinch (*Chloris chloris*), mistle thrush (*Turdus viscivorus*), swift (*Apus apus*) and woodcock (*Scolopax rusticola*).

Wales Red-listed (BoCCW4) species included goldcrest (*Regulus regulus*), lesser black-backed gull (*Larus fuscus*), meadow pipit, whitethroat (*Curruca communis*), and willow warbler.

The closest Schedule 1 record returned via SEWBReC searches was for a goshawk observed directly over Tip 1 within the Scheme in September 2021. The closest S7 record was for a flock of starling recorded within the Scheme at the Tip 1.

### 3.3.2 OTHER SPECIES OF CONSERVATION CONCERN

There were 132 records for UK and/or Wales Amber-listed species of medium concern, relating to 12 species.

Species of medium conservation concern within 1km of the Scheme comprised common gull (*Larus canus*), common sandpiper (*Actitis hypoleucos*), dipper, great black-backed gull (*Larus marinus*), green woodpecker, grey heron, grey wagtail, mallard, redstart, shoveler (*Spatula clypeata*), snipe (*Gallinago gallinago*), and wheatear.

## 4 FIELD SURVEY RESULTS

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A list of all bird species noted during both ground-nesting and vantage point surveys is listed in Appendix B.

### 4.1 HABITATS

The Main Site comprised extensive areas of colliery spoil. The central area of Tip 2 was largely bare, offering little in terms of suitable habitat for birds. Vegetative cover was mainly confined to the base of the outer slopes. Habitat consisted of continuous bracken, dry dwarf shrub heath, and dry heath/acid grassland mosaic, with occasional patches of marshy grassland and strips of coniferous woodland. Continuous bracken dominated land immediately south-east of the Tip 2 and along with scattered trees skirted the south-western edge. Habitat in these areas was suitable for a range of commonly occurring scrub and woodland bird species.

North/north-west of the Tip 2 was dominated by the sheep and cattle-grazed grassland mosaic of Mynydd y Grug Common SINC. This area was interspersed with sizeable parcels of continuous bracken and included patches of gorse (*Ulex europaeus*) and a pond at its northernmost edge. Habitat was suitable for a range of both ground-nesting and scrub residing species.

Further areas of improved grassland, poor semi-improved grassland, and semi-improved acid grassland offering potential habitat for ground-nesting bird species were located east of Tip 2.

A broad strip of clear fell with occasional exposed standing deadwood was situated north-east of Tip 2. The area was bordered by coniferous plantation woodland at its north-eastern edge and mixed woodland at its northern edge. Habitat was suitable to support ground-nesting species with a preference for felled woodland such as nightjar and tree pipit.

The southern reaches of Tip 1 also comprised widespread areas of bare colliery spoil. The plateau at the top, however, displayed a general increase in vegetative cover with a mosaic of acid grassland, dry dwarf shrub heath, and lichen/bryophyte heath present.

Semi-natural broadleaved woodland encompassed the southern extent of Main Site providing habitat suitable for a range of common woodland species.

Woodland comprising parcels of coniferous plantation, semi-natural broadleaved, and semi-natural mixed, interspersed with wide-ranging areas of clearfell surrounded the extent of the Haul Road. The habitat was suitable for both resident and summer migrant bird species including Schedule 1 species such as crossbill (*Loxia curvirostra*) and to a lesser extent within the footprint of the Scheme, goshawk.

### 4.2 PRE-BREEDING RAPTOR NEST SITE SURVEY

No raptor nest sites were confirmed during the survey.

A summary of the survey results is detailed in Table 4-1.

See Drawing GC4277-WSP-74-XX-M2-L-3008 for locations of nest sites.

Table 4-1 – Results of pre-breeding raptor nest site survey

| Species      | Approximate nest site location/<br>description                                     | Confidence<br>level of<br>attribution of<br>species | Comment   |
|--------------|--|---|---|
| Buzzard      | ST 18781 90860<br>In pine tree species (Pinus sp.)                                 | Possible  |   |
| Buzzard      | ST 17618 91490<br>In Scots pine (Pinus sylvestris)                                 | Possible  |   |
| Sparrowhawk  | ST 20678 90982<br>In crown of alder tree at<br>approximately 20m high              | Possible  |   |
| Sparrowhawk  | ST 20374 90681<br>Standing dead larch (Larix sp.)<br>tree                          | Possible  |   |
| Sparrowhawk  | ST 18430 90948<br>Old nest in Scots pine   | Possible  |   |
| Sparrowhawk  | ST 17645 91675<br>White splash on vegetation below<br>coniferous tree              | Possible  |   |
| Barn owl     | ST 19338 90799<br>Barn owl box mounted on oak<br>(Quercus sp.) tree                | -   | Unable to see box contents  |
| Tawny owl    | ST 19528 90723<br>Tawny owl box mounted on tree<br>near Ynys Hywel Activity Centre | -   | Unable to see box contents  |
| Carrion crow | ST 18153 90957<br>In coniferous tree species                                       | Possible  | Considered large enough for<br>small raptor species to nest.<br>Carrion crow nests are<br>known to be repurposed by<br>raptors such as hobby. |
| Carrion crow | ST 17629 91586<br>In larch tree  | Possible  | Considered large enough for<br>small raptor species to nest   |
| Unknown      | ST 18404 90921<br>Bird nest or possible squirrel dray                              | -   | Considered large enough for<br>small raptor species to nest   |
| Unknown      | ST 18088 91006<br>Two nests in larch tree  | -   | Considered large enough for<br>small raptor species to nest   |



### 4.3 VANTAGE POINT SURVEY

A total of 12 hours was spent over four visits at VPs: two visits at Tip 2 (VP1) and two visits at Tip 1 (VP2).

Five raptor/owl species were recorded during VP surveys. Species comprised Schedule 1 species red kite, and hobby; UK Amber-listed sparrowhawk and tawny owl; and buzzard a species of low conservation concern in UK/Wales.

The ground-nesting nocturnal species, nightjar, was also observed in an area of clear fell next to VP1.

See Drawing GC4277-WSP-74-XX-M2-L-3008 for flight lines of raptor/owl species and clear fell location where nightjar was observed.

A summary of the raptor results from the VP survey is listed in Table 4-1.

**Table 4-1 – Raptor/owl and nightjar results from evening Vantage Point (VP) survey**

| Date and VP location | Time  | Species     | Duration of observation | Count | Flight height | Flight direction       | Distance/direction from observer | Flight type/behaviour   |
|----------------------|-------|-------------|-------------------------|-------|---------------|------------------------|----------------------------------|---|
| 13 April 2023<br>VP1 | 18:55 | Sparrowhawk | 1 min                   | 1     | 60-80 m       | SE to NW               | 300 m NE                         | Rising from trees<br>Circling/<br>commuting   |
|                      | 18:59 | Red kite    | 3 min                   | 1     | 50 m          | NE to SW<br>Departed W | 250 – 300 m NE                   | Commuting   |
|                      | 19:18 | Red kite    | 5 min                   | 2     | 50-100 m      | NW to S                | 500 m NW                         | Circling/<br>commuting  |
| 17 May 2023<br>VP2   | 18:01 | Buzzard     | Heard Not Seen          | 1     | N/A           | N/A                    | N/A                              | Two calls   |
|                      | 18:05 | Hobby       | 2 – 3 mins              | 2     | 40 m          | SW to NE<br>E to NW    | 20 – 30 m W                      | Two (pair?) seen rising from trees and circling. One observed hunting low over south-facing slope of Tip 1. |
|                      | 18:15 | Buzzard     | 30 secs                 | 1     | 20 m          | E to W                 | 20 m above surveyor              | Commuting   |
|                      | 20:15 | Buzzard     | 20 mins                 | 1     | 40 m          | E to W                 | 500 m S                          | Flew to pylon and perched   |

|                       |                |                            |                |     |             |                              |                  |   |
|-----------------------|----------------|----------------------------|----------------|-----|-------------|------------------------------|------------------|---|
| 14 June 2023<br>VP1   | 19:22          | Buzzard                    | 57 mins        | 1   | 250 m       | SE to NW to SE to E          | 300 m SE – 1km E | Circling/gliding and perching intermittently  |
|                       | 19:28          | Sparrowhawk                | 2 mins         | 1   | 300 – 400 m | S to N                       | 300 – 400 m E    | Gliding   |
|                       | 21:15          | Nightjar                   | Heard Not Seen | 1   | N/A         | N/A                          | N/A              | Brief male churring song  |
|                       | 21:35 to 22:31 | Nightjar                   | 56 + mins      | 2   | <5m to 20 m | Circled whole clearfell area | <5m - 200 m      | Male wing-clapping and churring from exposed standing deadwood and trees at woodland edge. Returning repeatedly to song posts. Pair seen flying together occasionally. 'Co-ick' flight calls from pair. |
|                       | 22:15          | Tawny owl                  | 1 min          | 1   | 10 m        | N to S to W                  | 50 m N           | Briefly landed on standing deadwood before flying off.  |
| 04 August 2023<br>VP2 | N/A            | No raptor species recorded | N/A            | N/A | N/A         | N/A                          | N/A              | N/A   |

#### 4.3.1 NIGHTJAR

A male nightjar was heard 'churring' and observed within clear fell adjacent to VP1 in June. Territorial display in the form of repeatedly returning to favoured song posts of exposed standing deadwood or woodland edge trees; circling and patrolling with typically raised wings and slow wing beats; wing-clapping; and 'coo-ick' flight calls were all witnessed. White wing patches of the male were clearly visible particularly when flying at close quarters to surveyors.

The female, lacking the white wing patches, was also seen although less frequently than the male. The pair were occasionally seen flying together. Both individuals were heard calling ('coo-ick') in flight.

The male remained churring from exposed standing deadwood after the survey was completed.

#### 4.3.2 GOSHAWK

No evidence of goshawk was witnessed. No individuals were observed during either daytime breeding bird or evening VP surveys.

#### **4.3.3 RED KITE**

A pair of red kites were seen together circling and commuting from north-east to south-west over Mynydd y Grug Common and beyond during the April survey at VP1.

Although not seen again on other VP surveys red kites were seen by surveyors undertaking other surveys in April and May. Behaviour on these occasions consisted of circling and commuting over Mynydd y Grug Common and adjacent farmland to the west of Main Site.

#### **4.3.4 BARN OWL**

No evidence of barn owl was observed during VP surveys in the form of sightings or calls.

#### **4.3.5 KESTREL**

No evidence of kestrel was observed or heard during VP surveys.

A single kestrel was seen hovering briefly near Tip 2 by surveyors undertaking a daytime breeding bird survey in May 2023.

#### **4.3.6 HOBBY**

Two hobbies were seen rising and circling above trees south-west of Tip 1 on 17 May 2023. One was observed hunting low over the south-facing front of the tip in pursuit of prey. Due to the grey spoil background surveyors were unable to identify the prey species.

Both individuals were then watched flying away from the area to the north-west.

During the ground-nesting bird survey in May a hobby was seen flying south to north over woodland at the southern extent of the Scheme.

#### **4.3.7 PEREGRINE**

No evidence of peregrine was seen or heard during VP surveys.

A single peregrine was noted flying from woodland north-east of Tip 2 and away south-west over the tip during the ground-nesting bird survey in April 2023.

Two peregrines were seen flying together over the southern extent of Main Site while undertaking another survey in July 2023. One individual was calling loudly overhead.

When conducting the April 2023 VP1 survey, local members of the public relayed to surveyors that peregrines were known to nest at the nearby Machen quarry (Verbal Communication, 2023).

#### **4.3.8 NON-TARGET RAPTOR/OWL SPECIES**

Sparrowhawk, a UK Amber-listed species of medium conservation concern, was observed rising from trees and circling before heading off north-west during the VP1 April 2023 survey. Sparrowhawks were sighted on other surveys over and alongside the haul road near suitable breeding habitat. Behaviour consisted of individuals hunting low over fields and hedgerows or circling above the area.

Tawny owl, another UK Amber-listed species of medium conservation concern, was seen during the VP1 June 2023 survey. An individual flew low from south to north over the clearfell area north-east of Tip 2, briefly perching on standing deadwood before flying off west toward





woodland. Whilst undertaking another species-specific survey for the Scheme in October, surveyors flushed a tawny owl roosting in woodland at the southern boundary of the Scheme.

Buzzard, a species of low conservation concern, was sighted during both May (VP2) and June (VP1) surveys. Individuals were watched circling and perching on both occasions.

Buzzards were seen during daytime bird surveys in May, June, and July 2023. Most sightings involved an individual, or pair, circling above farmland west of Main Site or commuting over the tips. Unseen individuals were heard calling loudly and repeatedly from the same direction by surveyors undertaking other surveys.

In July 2023 a family party of buzzards (three individuals) was noted in scattered trees near the western edge of Tip 1. Individuals flew low over the trees together while calling loudly and perching intermittently.

Buzzards were also seen on occasion circling over suitable breeding habitat whilst conducting other surveys in the vicinity of the haul road.

#### **4.3.9 OTHER NOTABLE SPECIES**

Tree pipit, a summer migrant species known to nest within areas of clearfell (Fergusson-Lees *et al.*, 2011) was observed during the VP1 June 2023 survey.

### **4.4 GROUND-NESTING BIRD SURVEY**

A total of 65 different bird species were recorded during the survey.

All eight of the ground-nesting target bird species listed in Table 2-2 were recorded breeding; five of these species were confirmed to have bred within the Scheme; two species were probably breeding; and one species was considered possibly breeding.

A full list of ground-nesting bird species recorded during the breeding bird survey is presented in Table 4-2 along with each species relative level of conservation concern, statutory and non-statutory designation and assigned conservation value level.

Species that are not identified as being on the Red or Amber lists in Table 4.2 or are not S7 species, are all green listed species of low conservation concern.

**Table t-2 - Summary of data for ground-nesting bird species recorded within the Scheme.**

| Common name    | Scientific name                | WCA Schedule 1 | SPI Wales | UK Red list | UK Amber list | Wales Red list | Wales Amber list | Breeding status | Conservation importance of breeding species | Nature Conservation value of breeding species | Breeding territories |
|----------------|--------------------------------|----------------|-----------|-------------|---------------|----------------|------------------|-----------------|---|---|----------------------|
| Nightjar       | <i>Caprimulgus europaeus</i>   |                | *         |             | *             |                |                  | Probable        | High  | Local   | 1                    |
| Cuckoo         | <i>Cuculus canorus</i>         |                | *         | *           |               | *              |                  | Possible        | High  | Local   | 1                    |
| Skylark        | <i>Alauda arvensis</i>         |                | *         | *           |               |                | *                | Confirmed       | High  | Local   | 16                   |
| Wood warbler   | <i>Phylloscopus sibilatrix</i> |                | *         | *           |               | *              |                  | Possible        | High  | Local   | 1+                   |
| Willow warbler | <i>Phylloscopus trochilus</i>  |                |           |             | *             | *              |                  | Confirmed       | High  | Local   | 18                   |
| Chiffchaff     | <i>Phylloscopus collybita</i>  |                |           |             |               |                |                  | Probable        | Low   | Site  | 4                    |
| Stonechat      | <i>Saxicola rubicola</i>       |                |           |             |               |                |                  | Confirmed       | Low   | Site  | 6                    |
| Wheatear       | <i>Oenanthe oenanthe</i>       |                |           |             | *             |                | *                | Confirmed       | Medium                                      | Local   | 1                    |
| Meadow pipit   | <i>Anthus pratensis</i>        |                |           |             | *             | *              |                  | Confirmed       | High  | Local   | 11                   |
| Tree pipit     | <i>Anthus trivialis</i>        |                | *         | *           |               | *              |                  | Probable        | High  | Local   | 2+                   |
| Reed bunting   | <i>Emberiza schoeniclus</i>    |                | *         |             | *             |                |                  | Possible        | High  | Local   | 1                    |

## 4.5 TERRITORY ANALYSIS

Territory analysis determined the spatial distribution and number of breeding bird territories for ground-nesting bird species within the Scheme. Species of high, medium, and low conservation concern are shown in Drawing GC4277-WSP-74-XX-DR-L-3009. Note that the majority are approximate locations of breeding territories and do not represent actual nest sites.

There were 60 ground-nesting breeding bird territories identified within Main Site.

At least another three incidental records for ground-nesting breeding territories; two for tree pipit and one for wood warbler were recorded alongside the Haul Road whilst undertaking other species-specific surveys.

Additionally, cuckoo, a brood parasite of ground-nesting bird species meadow pipit, was holding territory on a single occasion within suitable breeding habitat.

## 4.6 GROUND-NESTING SPECIES OF HIGH CONSERVATION CONCERN

Ground-nesting bird species of high conservation concern included a total of 49 territories by seven different species within Main Site. Species comprised skylark, willow warbler, meadow pipit, tree pipit, reed bunting, cuckoo, and nightjar.

Skylark, a S7 and UK Red-listed species was a commonly recorded breeding species of high conservation concern within the Scheme. Most breeding territories (15) were held within the open grasslands of Mynydd y Grug Common SINC and adjacent farmland north-west of Tip 2. At least one further territory was noted within grassland east of Tip 2.

Behaviour typical of breeding such as males singing above territories and females 'hovering' over nest sites before dropping into vegetation was frequently witnessed. Breeding was confirmed when adults were observed collecting and carrying food back to nest sites.

Meadow pipit, a Wales Red-listed and UK Amber-listed species, was mainly recorded within open grassland and continuous bracken, favoured habitats of the species (Fergusson-Lees *et al.*, 2011), within Mynydd y Grug Common SINC.

Typical breeding behaviour in the form of males performing 'parachuting' song-flights and singing from prominent perches such as stone walls, scattered trees, and tops of bracken was observed. Breeding was confirmed when an adult was seen carrying food to a nest site.

A male meadow pipit was heard singing briefly and an individual was seen frequenting the longer grassy vegetation near gorse bushes on the plateau of Tip 1. It was considered possibly breeding on Tip 1.

Other meadow pipit breeding territories were noted within open grassland east and south-east of Tip 2.

Willow warbler, a Wales Red-listed species was the most prolific breeding species of high conservation concern confirmed breeding within the Scheme, with 18 breeding territories. Territories were held in scrub with scattered trees or woodland edges. The '*hoo-eet*' off-nest call of the female was frequently heard across the Scheme during May and June. Breeding was confirmed by an adult off-nest calling and carrying food in scrub habitat at the western edge of Tip 2.



Nightjar, a ground-nesting species, and a “target species” for VP surveys was also recorded as a probable breeder within the clearfell area immediately north-east of Tip 2 (see 4.3.1).

Tree pipit, a S7 and UK/Wales Red-listed species, was also recorded as a probable breeder within the same clearfell area as probable breeding nightjar. A male was seen singing from the top of exposed standing deadwood and performing its parachuting song-flight in May. Tree pipits were subsequently seen in the same clearfell on ground-nesting and VP surveys in June 2023. In July, several tree pipits were seen together opposite the clearfell in scattered trees at the north-eastern edge of Tip 2.

Possible breeding reed bunting was recorded in the vicinity of the pond in the northernmost sector of the Scheme. A male reed bunting was seen and heard singing from a tree and a female was also observed in the area. The pond was surrounded by rush (*Juncus* spp.) and grassy tussocks in which reed bunting are known to breed (Fergusson-Lees *et.al.*, 2011).

Cuckoo, a S7 species of principal importance in Wales (SPI) and a UK/Wales Red-listed species was heard calling between Tip 2 and Tip 1 during the May VP2 survey. Although not always a ground-nesting species one of its favoured hosts is meadow pipit (Fergusson-Lees *et.al.*, 2011) which was recorded breeding across the Scheme. Cuckoo was assessed as possibly breeding within the Scheme.

The Haul Road did not form part of the ground-nesting birds transect route, however wood warbler, another ground-nesting species was heard singing within suitable woodland habitat by surveyors carrying out other surveys. Wood warbler was assessed as a possible breeder.

In addition, at least two singing male tree pipits were recorded within clear fell areas adjacent to the Haul Road. The species was therefore assessed as a possible breeder.

## **4.7 GROUND-NESTING SPECIES OF MEDIUM CONSERVATION CONCERN**

Wheatear, a UK/Wales Amber-listed species of medium conservation concern, was confirmed breeding in the cavity of an old stone wall settled into a grassy bank east of Tip 2. A pair collecting and carrying food items such as green caterpillars were seen visiting the cavity.

## **4.8 GROUND-NESTING SPECIES OF LOW CONSERVATION CONCERN**

Chiffchaff and stonechat both UK/Wales Green-listed species of low conservation concern were recorded breeding within the Scheme.

Chiffchaff was recorded as a probable breeder in woodland and scrub edges where thick, low vegetation existed at the southern extent around Tip 1. Males were heard singing and individuals were heard off-nest/alarm calling ‘*hweef*’ within suitable breeding habitat.

Stonechat were confirmed breeding within a gorse patch near a pond at the northernmost extent of the Scheme. A pair were seen and heard alarm calling and a female was later observed from distance carrying food.

Most stonechat breeding territories within the Scheme were associated with gorse or continuous bracken patches.

## 4.9 OTHER NOTABLE BREEDING SPECIES

Linnet, a S7 and UK/Wales Red-listed species was confirmed breeding within gorse and bracken patches in Mynydd y Grug Common SINC. Males were seen and heard singing and pairs were seen collecting nest materials and carrying food into vegetation.

A juvenile whitethroat, a Wales Red-listed and UK Amber-listed species, landed in front of surveyors conducting another species-specific survey in July. Occurring within suitable scrub habitat where whitethroat had previously been recorded singing, the species was assessed as a highly probable breeder.

Spotted flycatcher, another summer migrant S7, UK/Wales Red-listed species was confirmed breeding within a wall, west of the quarry pond, at the southern extent of the site. An adult was seen catching prey items and visiting the nest site with food. Spotted flycatcher is considered an 'uncommon breeding summer visitor' in Gwent (GOS, 2021).

## 5 DISCUSSION AND EVALUATION OF IMPACTS

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### 5.1 DESIGNATED SITES

#### STATUTORY DESIGNATED SITES

Two statutory designated sites were located within 1km of the Scheme, comprising two LNR sites. The haul road passes through Graig Coch LNR cited as supporting kingfisher and redstart (see Table 3-1) over approximately 530m of its length. Flatwood Meadow LNR is located approximately 170m north of the eastern sector of the haul road.

There is potential for woodland habitat, highly suitable to support a range of breeding species, to be adversely affected if widening of the track proposed for the Haul Road is required to facilitate the work. Pollution and short-term disturbance in the construction phase of the development is likely to cause breeding and non-breeding species to disperse temporarily into the wider landscape.

If construction is carried out in the main breeding bird season (March to August inclusive) it may result in additional competition for breeding territories outside of the Scheme. Given the extent and quality of available suitable breeding habitat in the local landscape it is likely that the development will not, however, have a long-term detrimental impact on breeding success.

If works are completed outside of the breeding season (September to February inclusive) there is unlikely to be any short or long-term adverse impacts on breeding success.

#### NON-STATUTORY DESIGNATED SITES

Two Sites of Importance for Nature Conservation (SINCs) are located partly within the Scheme. An extensive area of the Scheme, located to the north-west of the Tip 2, overlaps with a considerable portion of the Mynydd y Grug SINC. Immediately bordering this area to the north-west is Mynydd Bach Slopes SINC. Twyn yr Oerfel SINC also overlaps with the Scheme to a lesser extent, east of Tip 2.

A further five SINCs, Berth Goch Wood, River Sirhowy, Graig y Prisiad Woodlands, Mynydd Machen, and Sirhowy Country Park Meadows fall within 250m of the Scheme.

There is potential for important grassland, bracken, and pond habitats within Mynydd y Grug SINC to be impacted by direct (partial) loss through excavation e.g. for construction of a pumping station/pond, drainage channels, and/or creation of a coal stockyard. This SINC is cited to be supporting skylark, meadow pipit, stonechat, wheatear, and linnet (see Table 3-2) (SEWBRcC, 2023).

Over 30 house martins (*Delichon urbicum*), a UK Red-listed and Wales Amber-listed species, were recorded skimming over the pool within Mynydd Y Grug Common SINC following a prolonged period of dry weather. Fresh water is essential for birds to drink and bathe. House martin also requires access to wet mud, an essential component for nest construction. There is therefore potential for breeding birds to be indirectly adversely impacted by any degradation of the pond feature via pollution and loss of suitable nest building habitat.

Further adverse impact could occur through loss, damage, and/or degradation of habitats within Mynydd y Grug and/or Twyn yr Oerfel through deposition of materials such as spoil.



Modification of the habitats, for example through tree planting within existing open habitats such as grassland or bracken, could also adversely impact the integrity of current habitats within the SINCs which would affect the species that depend upon them. For example, skylarks (S7 species) prefer open grassland habitat as found on Mynydd y Grug SINC for breeding, any changes to that habitat may therefore impact upon breeding success.

There is potential for all habitats associated with Mynydd y Grug and/or Twyn yr Oerfel SINCs to be adversely impacted in terms of pollution via surface run-off and dust from materials and machinery, and/or fuel/spills.

## 5.2 BIRDS

The desk study returned records for several protected bird species within 1km of the Scheme, including records for Schedule 1 and S7 species. The probability of these species breeding within the survey area for the Scheme was assessed in terms of sightings and habitat suitability. See Table 5-1.

**Table 5-1 – Probability of protected species breeding with the Scheme**

| Species    | Legislation | Probability | Notes   |
|------------|-------------|-------------|---|
| Brambling  | WCA1.1      | Unlikely    | Winter visitor  |
| Crossbill  | WCA 1.1     | Possible    | No sightings although coniferous plantation woodland alongside the haul road was considered to offer some suitability.  |
| Fieldfare  | WCA 1.1     | Unlikely    | Winter visitor  |
| Firecrest  | WCA1.1      | Possible    | No sightings although coniferous plantation woodland alongside the haul road was considered to offer some suitability.  |
| Goshawk    | WCA 1.1     | Unlikely    | No evidence recorded. Coniferous plantation and mature broadleaved woodland alongside haul road offered limited suitability and habitat considered more optimal in wider landscape. |
| Hobby      | WCA 1.1     | Unlikely    | Sighted on a couple of occasions flying over the Scheme although no evidence for breeding recorded.   |
| Kingfisher | WCA1.1      | Unlikely    | No water bodies suitable to support breeding kingfisher were recorded.  |
| Peregrine  | WCA 1.1     | Unlikely    | No tall buildings, or cliffs, suitable for nesting were recorded.<br><br>Peregrine was known to nest within Machen Quarry approximately 2km   |

| Species         | Legislation | Probability | Notes   |
|-----------------|-------------|-------------|---|
|                 |             |             | south-east of the haul road's eastern extent. (Verbal Communication, 2023).   |
| Red kite        | WCA 1.1     | Unlikely    | Sighted on several occasions although no breeding evidence recorded. Habitat such as small woodland copses/scattered trees on edges of farmland outside the Scheme considered more optimal habitat for nesting. |
| Redwing         | WCA 1.1     | Unlikely    | Winter visitor  |
| Bullfinch       | S7          | Probable    | Recorded within the Scheme. Woodland/scrub habitat considered suitable for breeding.  |
| Cuckoo          | S7          | Possible    | Meadow pipit, a favourite host species of cuckoo was recorded breeding within the Scheme. A male cuckoo was heard calling in suitable breeding habitat.   |
| Dunnock         | S7          | Probable    | Recorded within the Scheme. Woodland/scrub habitat considered suitable for breeding.  |
| Herring gull    | S7          | Unlikely    | Record flying over. No suitable habitat for breeding within the Scheme.   |
| House sparrow   | S7          | Unlikely    | Considered likely to be nesting within residential dwellings or farm buildings outside of the Scheme.   |
| Kestrel         | S7          | Unlikely    | Sighted on a single occasion. Habitat such as small woodland copses/scattered trees on edges of farmland outside the Scheme considered more optimal habitat for nesting.  |
| Lesser redpoll  | S7          | Unlikely    | Common winter visitor and uncommon resident breeder in Gwent (GOS, 2021)  |
| Linnet          | S7          | Confirmed   | Pairs seen collecting nest materials and carrying food into gorse scrub on Mynydd y Grug.   |
| Nightjar        | S7          | Probable    | Breeding behaviour observed in clearfell. See Section 4.3.1.  |
| Pied flycatcher | S7          | Unlikely    | No observations for the species recorded.   |

| Species            | Legislation | Probability | Notes  |
|--------------------|-------------|-------------|--|
| Reed bunting       | S7          | Possible    | Male singing in suitable breeding habitat (marshy grassland around pond) recorded.   |
| Skylark            | S7          | Confirmed   | Breeding behaviour observed including adults carrying food on Mynydd y Grug common.  |
| Song thrush        | S7          | Probable    | Recorded within the Scheme. Woodland/scrub habitat considered suitable for breeding.   |
| Spotted flycatcher | S7          | Confirmed   | Female observed carrying food to nest site in wall near the quarry pond at southerly extent.   |
| Starling           | S7          | Unlikely    | Considered likely to be nesting within residential dwellings or farm buildings outside of the Scheme.  |
| Tree pipit         | S7          | Probable    | Breeding behaviour observed within clearfell alongside haul road and VP1.  |
| Wood warbler       | S7          | Possible    | Male wood warblers recorded singing within suitable breeding habitat alongside haul road whilst undertaking other ecological surveys for the Scheme. |

Non-Schedule 1 species sparrowhawk and buzzard were sighted on several occasions whilst undertaking other ecological surveys in the vicinity of the haul road. Previous potential buzzard and sparrowhawk nests were noted during the pre-breeding raptor nest site survey within suitable habitat. As such it was considered possible that both species were breeding within the Scheme.

Since males of both skylark and meadow pipit are highly mobile when performing song-flights the number of breeding territories for each species recorded was considered a conservative estimate for the total present within the Scheme.

The breeding bird assemblage comprised species that are generally common and widespread through Gwent Vice County 35 (VC35) which incorporates Bedwas Tips, this includes most of the species of high and medium concern recorded during the survey.

The Scheme overall is considered of **local** nature conservation value (see Appendix D) for birds due to the number of different bird species present (65) and the high proportion of species of high and medium concern recorded as breeding within the Scheme.



## 5.3 IMPACT ASSESSMENT

The assessment of likely impact on ground-nesting birds and raptors arising from the development is based on;

- An understanding of individual species ecological requirements.
- Number and location of breeding territories across the survey area.
- Extent of suitable breeding habitat outside the footprint of the development, in the wider landscape.
- Conservation status based upon legislation (S1/SPI) and current non-statutory designations (red/ amber/ green listed BoCC5 and BoCCW3).
- Likely location and extent of works and associated siting of plant and access routes pre- and during construction.
- Period of time over which the development will be carried out.
- Overall design of the development, including lighting and landscaping.

### 5.3.1 POTENTIAL IMPACTS

Potential impacts on ground-nesting or raptor species as a result of the development include, but are not confined to;

- Direct mortality, habitat loss (foraging, shelter and nesting) and fragmentation, degradation of habitats and increased disturbance (lighting, noise), air and water pollution.
- The effect of these potential impacts includes, but are not limited to; reduced species abundance, reduced species richness, reduced reproductive success, loss of breeding sites, changes to and/or loss of breeding territories.

The potential impacts of the development and their likely magnitude as discussed; are based upon no mitigation measures being applied.

#### Habitat clearance

Removal of habitat (vegetation and ground clearance) is likely to be required to facilitate the works e.g., if widening of the haul road is necessary and/or excavation of Mynydd y Grug for a pumping station/pond, drainage channels, or a coal stockyard. Removal of vegetation on the plateau of Tip 1 to facilitate excavation works and other habitat clearance to construct compounds and facilities is also likely to be necessary. If work is carried out during the breeding season (i.e. March to August inclusive) the impact on breeding birds is likely to be short-term and high adverse and result in inadvertent damage or destruction of nests.

The highest concentration of ground-nesting breeding birds was within Mynydd y Grug SINC. Although no evidence of raptor breeding was recorded, woodland and in particular coniferous plantation in the vicinity of the haul road, was considered to offer some limited suitability for Schedule 1 goshawk although other more optimal habitat for breeding existed outside the footprint of the Scheme. Woodland habitat alongside the haul road was also considered to offer suitability for more common raptor species such as a buzzard and sparrowhawk.

#### Habitat loss and fragmentation

Habitat suitable for ground-nesting and other breeding birds will be lost if grassland, bracken, and scrub such as those present in Mynydd y Grug SINC are removed to facilitate the works.



Displacement of a moderate number of bird species known to breed within and/or in proximity to the SINC including species of high and medium conservation concern such as skylark, meadow pipit, reed bunting, linnet, and willow warbler is likely to occur.

The adverse impact of habitat loss is likely to be high in the short-term and moderate in the long-term for species such as skylark, meadow pipit, and reed bunting at a local scale. Although alternative grassland habitat for breeding exists in the wider landscape the competition for breeding territories by a potentially high number of displaced breeding birds is likely to be greatly increased.

An abundance of alternative scrub habitat for species such as linnet and willow warbler existed outside Mynydd y Grug SINC.

Habitat suitable for woodland species will be lost if widening of the Haul Road is required to facilitate the works. Impact of such loss however is likely to be low in the short-term and low to negligible in the short-term due to an abundance of alternative suitable woodland breeding habitat both inside and outside the Scheme.

### **Disturbance from construction work**

Construction work will likely require additional lighting. Noise levels will increase and there is the likelihood of air pollution from dust and exhaust fumes created by plant and machinery.

Disturbance is likely to lead to avoidance of, and displacement from, construction areas and their vicinity by some species. Breeding success may be impaired and a reduction in feeding opportunities could cause a decline in species abundance.

Ground-nesting breeding species of high conservation concern such as skylark and meadow pipit are most likely to be impacted by such disturbance if excavation works are undertaken within Mynydd y Grug SINC e.g., for pumping station/pond, drainage channels, and/or creation of a coal stockyard.

Impact is likely to be high in the short-term and moderate in the long-term for ground-nesting bird species.

Owing to the presence of suitable habitat for scrub and woodland species outside the Scheme the adverse impact is likely to be high in the short term and low to negligible in the long-term for such species.

It was not known if a barn owl box situated on an oak tree north of the Haul Road, west of Ynys Hywel Activity Centre, was in use. There may therefore be some limited potential to disturb Schedule 1 barn owl through widening of the Haul Road if required and/or increased traffic during the operational phase of the Scheme.

### **Waterbody pollution and disturbance**

A pond was located within the northernmost sector of the Scheme in Mynydd-y-Grug SINC. Fresh water is an important resource for birds drinking, bathing, and nest building (see also 5.1 Non-statutory Designated Sites).

A quarry pond with a large drainage channel flowing into it from the tips above was located at the southern extent of the Scheme. Grey wagtail, a UK Amber-listed species of medium conservation concern was recorded foraging for invertebrate prey items on an exposed bank at the water's edge.



There is therefore potential for excavation works or removal/deposition of spoil to adversely impact water quality across the Scheme through pollution and/or habitat degradation. This would potentially impact birds through direct mortality or loss of availability of food items.

Pollution run-off has the potential to have a high adverse impact in the short-term. Long-term impacts are likely to be low once works are completed.

The potential short-term and long-term impacts and likely magnitude of impact discussed are based upon no mitigation measures being applied.



## 6 CONCLUSION

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### 6.1 SUMMARY OF SURVEY

The Survey Area was found to support a relatively diverse range of ground-nesting bird species. The assemblage of species recorded is considered typical of the habitats present within the Scheme and its context within the wider landscape and geographical location.

Although nine of the 11 ground-nesting bird species recorded are classified as species of conservation concern i.e., listed as SPI and/ or Red and Amber-listed birds of conservation concern, most are common and widespread in Gwent and territories were frequently recorded across the Scheme in suitable habitat.

No evidence of breeding Schedule 1 raptor species such as territorial or courtship behaviour was recorded during either pre-breeding raptor nest check, VP, or ground-nesting and raptor bird surveys.

It was not known whether an owl box located west of Ynys Hywel Activity Centre, north of the Haul Road supported Schedule 1 barn owl.

The general assemblage of birds recorded across the route is assessed as of local importance in terms of nature conservation value.

### 6.2 SUMMARY OF IMPACT

Works within the footprint of the Scheme will directly impact upon, breeding, sheltering and foraging habitats for a range of species including ground-nesting birds and commonly occurring raptor species.

The Scheme and wider landscape provides alternative suitable breeding habitat for all species recorded as breeding within the Scheme during the survey. Competition for territories in the surrounding area for species such as skylark and/or meadow pipit however may be greatly increased by the number of displaced individuals from high density breeding areas such as Mynydd Y Grug SINC. The development is therefore considered to have overall high short-term and moderate to low long-term impact at a local level for all species of breeding bird recorded within the Scheme.

Habitat clearance of grassland, scrub, bracken, woodland, clear fell, and/or scattered trees to facilitate the works has potential to disturb breeding birds. Impact is likely to be high in the short-term for individual nesting birds that may be inadvertently disturbed and low in the long-term due to the presence of suitable breeding habitat in the wider landscape.

Removal or deposition of spoil has the potential to have a high short-term adverse impact upon birds using freshwater resources to drink, bathe, and breed through inadvertent pollution such as surface run-off and dust from materials and machinery, and/or fuel/spills.

The short-term and long-term and likely magnitude of impact discussed are based upon no mitigation measures being adopted (see Table 6-1).

**Table 6-1 – Short-term and long-term potential unmitigated impacts of the development**

| <b>Impact type</b>  | <b>Unmitigated impact short-term</b> | <b>Unmitigated impact long-term</b> |
|---|--------------------------------------|-------------------------------------|
| Habitat clearance (vegetation and ground clearance) - general | High adverse                         | Low adverse                         |
| Habitat loss and fragmentation -                              | High adverse                         | Moderate to low adverse             |
| Disturbance from construction                                 | High adverse                         | Low to negligible adverse           |
| Pollution and disturbance                                     | High adverse                         | Low adverse                         |

If the recommendations for mitigation, compensation and enhancement detailed in section 7 are followed the magnitude of the adverse impacts on raptors/owls and ground-nesting bird species (including nightjar), both short and long term, will be reduced and the proposed works will also be compliant with relevant wildlife legislation.

## 7 RECOMMENDATIONS

---

### 7.1 MITIGATION

#### 7.1.1 TIMING OF WORKS

*Option 1 - All site clearance activities are undertaken outside of the breeding bird season (March – August inclusive).*

Works should be carried out in such a way as to ensure that no birds, eggs or active nests are damaged or destroyed.

All site clearance (vegetation removal, topsoil stripping etc) and construction activities should be undertaken between September and February inclusive in order to avoid the main bird breeding season i.e., March to August inclusive. This is the most effective way of avoiding impacts and meeting legal requirements.

*Option 2 - Partial site clearance activities undertaken during the bird breeding season.*

If compliance with Option 1 is not fully possible then the majority of the vegetation clearance shall be undertaken outside the bird breeding season ( September to February inclusive). Clearance of vegetation must be maintained in this period, and it is important that cut material is removed from site to ensure the area remains of low suitability for nesting birds; as species such as blackbird, dunnock and wren, which often select brush piles as nesting sites.

During the bird breeding season (March to August inclusive) other construction activities such as topsoil stripping shall only be undertaken once a suitably qualified ecologist has carried out a check for active bird nests. This will be carried out no more than 48 hours prior to commencement of works. If no active nests are identified works can proceed. If however an active nest is located a species-specific no works zone of undisturbed habitat (to be determined by the ecologist but no less than 5 m) must be established around the nest until the ecologist is satisfied that the nest is no longer active.

*Option 3 – Site clearance during the bird breeding season.*

A pre-construction bird survey will be required if any vegetation clearance or topsoil stripping is to be undertaken during the bird breeding season.

Prior to any construction activities (vegetation clearance, topsoil removal etc.) each area of suitable habitat will be searched by an ecologist within 48 hours of commencement of works to determine if nests are present.

If bird species are found to be nesting or constructing nests during this check, the ecologist will determine an appropriately sized exclusion zone dependent on species. Any exclusion zone must be maintained until the end of the breeding season or until young have fledged and left the vicinity of the nest site.

#### *Goshawk*

In the unlikely event that Schedule 1 species goshawk is found to be nesting within 300m (if trees are being removed) or 500m (if no trees are being removed) (Goodship and Furness, 2022) of works at any time during the development a risk assessment would be required to determine the likelihood



of birds being disturbed by the construction activities and to determine the appropriate extent of the exclusion zone. Any exclusion zone would need to be maintained until the end of the breeding season.

### **7.1.2 SITING OF PLANT, COMPOUNDS, AND ACCESS ROUTES**

Species such as nightjar have specific breeding habitat requirements and are likely to return to the same areas to breed in subsequent seasons (Fergusson-Lees *et al.*, 2011). Tree pipit may also return to the same clear fell habitat used in the previous breeding season

Skylark, meadow pipit, and reed bunting are likely to return to breed in the same grassland locations in subsequent years. Optimal habitat for these species should be retained where possible.

An ecologist with ornithological experience should be consulted prior to any construction of access routes, siting of plant, machinery, or compounds to minimise loss or disturbance to suitable breeding clear fell habitat and to avoid disturbance to nest sites of the above species.

### **7.1.3 POLLUTION CONTROL**

Standard best practice and pollution control measures should be implemented in accordance with relevant guidance (e.g., CIRIA, 2001 and Environment Agency (2018). Guidelines for Pollution Prevention (GPP), particularly GPP 5 Works and maintenance in or near water, outlined in NetRegs (NetRegs, 2018) to ensure that watercourses on site e.g., ponds and drainage channels, are not directly or indirectly adversely affected by silt, dust, uncontrolled surface water run-off, inappropriate storage of materials and/or inappropriate refuelling of machinery. These measures should be detailed in a Risk Management Plan/ Construction Environmental Management Plan (CEMP).

- All materials (especially if hazardous or toxic) should be stored securely at least 7 m away from the watercourse.
- All static machinery should be placed on drip-trays or oil absorbent nappies. Trays should be emptied regularly to ensure that they contain any spills.
- Refuelling of machinery should not be carried out on site.
- Location of site compounds should be discussed with an ecologist prior to commencement of the works.

### **7.1.4 TOOLBOX TALK**

All site operatives should receive a toolbox talk delivered by a suitably experienced ecologist prior to the commencement of work on the Scheme. The talk should cover the possible location of bird nests, nest identification and actions to be taken should a nest be discovered.

### **7.1.5 POST-OPERATIONAL PHASE**

#### **Reinstatement of habitat**

Where habitat removal is unavoidable the works shall be designed to ensure these are replaced or reinstated on a like for like basis, using existing seedbank (topsoil re-use) where possible to ensure habitat suitability for breeding birds is maintained e.g., the open grassland of Mynydd y Grug SINC.

Where woodland is removed, re-planting with native tree species on a 2:1 basis is recommended to maintain and enhance habitat for woodland breeding bird species. Consideration should be given to planting locations to ensure that existing high quality habitat is not impacted by planting.

### **Grazing regime**

Grazing should continue on Mynydd y Grug common post the operational phase to create favourable conditions for both nesting skylark and meadow pipit.

## **7.2 MONITORING**

Post-operational phase ground-nesting bird surveys will be required (timescales and frequency is likely to be stipulated as a planning condition). This will establish if ground-nesting bird species such as skylark and meadow pipit are continuing to use the area and to inform any additional measures required to increase the potential for such species to nest on site.

## **7.3 ENHANCEMENT**

Planning Policy Wales 11 (Welsh Government, 2021) advocates the enhancement of biodiversity in relation to sites. The following measures are recommended to comply with this policy:

### **Bracken control**

Management of bracken in the open grassland areas of Mynydd y Grug SINC. This will prevent encroachment and domination by bracken to ensure that optimal habitat for ground-nesting bird species such as skylark and meadow pipit is enhanced.

### **Creation of additional ponds**

Creation of additional wildlife ponds would be beneficial for bird species as well as amphibians, grass snake (*Natrix helvetica helvetica*), bats, mammals, and a range of invertebrates.

### **Installation of kestrel boxes**

Kestrel, a rapidly declining species in the UK, was recorded hunting within the Scheme near Tip 2. Provision of a nest box suitable for kestrel should be made within the Scheme boundary under the guidance of a suitably qualified ecologist.

### **Installation of small bird species nest boxes**

A range of bird boxes should be installed in suitable habitat within the Scheme under the guidance of an ecologist to enhance nesting potential for small birds. These should include open-fronted boxes and boxes with holes of 25, 30 and 32mm diameter.

Schwegler nest boxes, or similar type, are recommended for durability. An example of suitable boxes can be found at <https://www.nhbs.com>

**Note:** *The recommendations made in this report should be considered alongside recommendations for faunal species and habitats in other reports in respect to these works.*

## 8 REFERENCES

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- Barn Owl Trust (2012) *Barn Owl Conservation Handbook*, Pelagic Publishing, Exeter
- Bibby, C.J., Burgess, N.D. and Hill; D.A and Mustoe, S. (2000) *Bird Census Techniques-Second Edition* Academic Press, London.
- BTO Birdtrack.<https://app.bto.org/birdtrack/grid-refs/list-grid-species-new.jsp> [Accessed: July 2023].
- CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.
- Environment (Wales) Act (2016).
- European Ornithological Atlas Committee. 1979. *Categories of Breeding Bird Evidence*. European Ornithological Atlas Committee.
- Ferguson-Lees, J., et al. (2011) *A field guide to monitoring nests*. Thetford: British Trust for Ornithology.
- Gilbert, G., Gibbons, D.W., Evans, J. (1998) *Bird monitoring methods*. RSPB, Sandy, Bedfordshire.
- Goodship, N.M. and Furness, R.W. (2022) *Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species*. A report from MacArthur Green to NatureScot.
- Google Earth (2023).
- Gwent Ornithological Society (GOS) (2021) *Gwent Bird Report Vol.55 2019*
- Johnstone, I.G., Hughes, J., Balmer, D.E., Brenchley, A., Facey, R.J., Lindley, P.J., Noble, P.G., and Taylor, R.C.(2022). *Birds of Conservation Concern in Wales 4: the population status of birds in Wales*. Milvus: the Journal of the Welsh Ornithological Society.
- Marchant, J. (1983) *Common bird census instructions*. BTO, Tring.
- NetRegs (2018) *Best Practice Guidelines (GPP) -Works and maintenance in or near water: GPP5* Available at <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/> Guidance for Pollution Prevention (GPPs) – Full list: <https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/> [Accessed July 2023]
- Stanbury, A., Eaton, M.A., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., Mulloch, N., Noble, D., and Win, I. (2021) *Birds of Conservation Concern 5: The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isles of Man and second IUCN red list assessment of extinction risk for Great Britain*. *British Birds* 114, 723-747.
- Scottish Raptor Study Group <https://www.scottishraptorstudygroup.org/raptors/goshawk/> [Accessed August 2023]





- Scottish Natural Heritage (SNH) (2017) Guidance Note – Recommended bird survey methods to inform impact assessment of onshore wind farms.
- South East Wales Biodiversity Records Centre (SEWBRc) (2023). Biodiversity Information Search – Bedwas Tips [Ref: 7000956].
- VENABLES, W.A., BAKER, A.D., CLARKE, R.M., JONES, C., LEWIS, J.M.S., and TYLER, S.J. (2008) *The Birds of Gwent*. Helm.
- Verbal communication (2023) Conversation between Richard Poole, Tara Okon, and local bikers regarding peregrines nesting in nearby Machen Quarry 13 04 2023.
- Wildlife and Countryside Act (1981) (as amended).
- WSP (2023) Bedwas Tips Reclamation Preliminary Ecological Appraisal (PEA) Report
- Preliminary Ecological Appraisal (PEA) Report

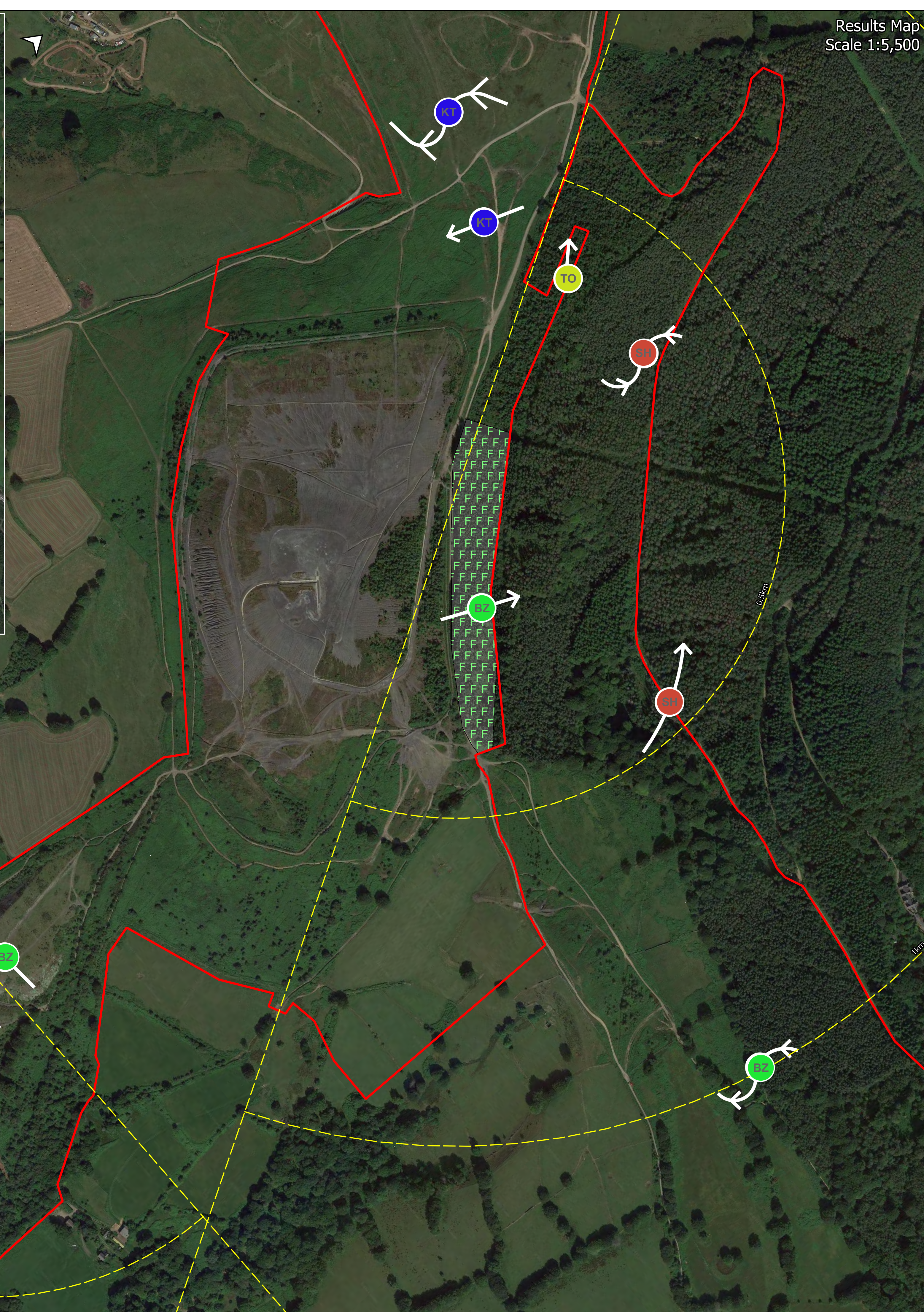
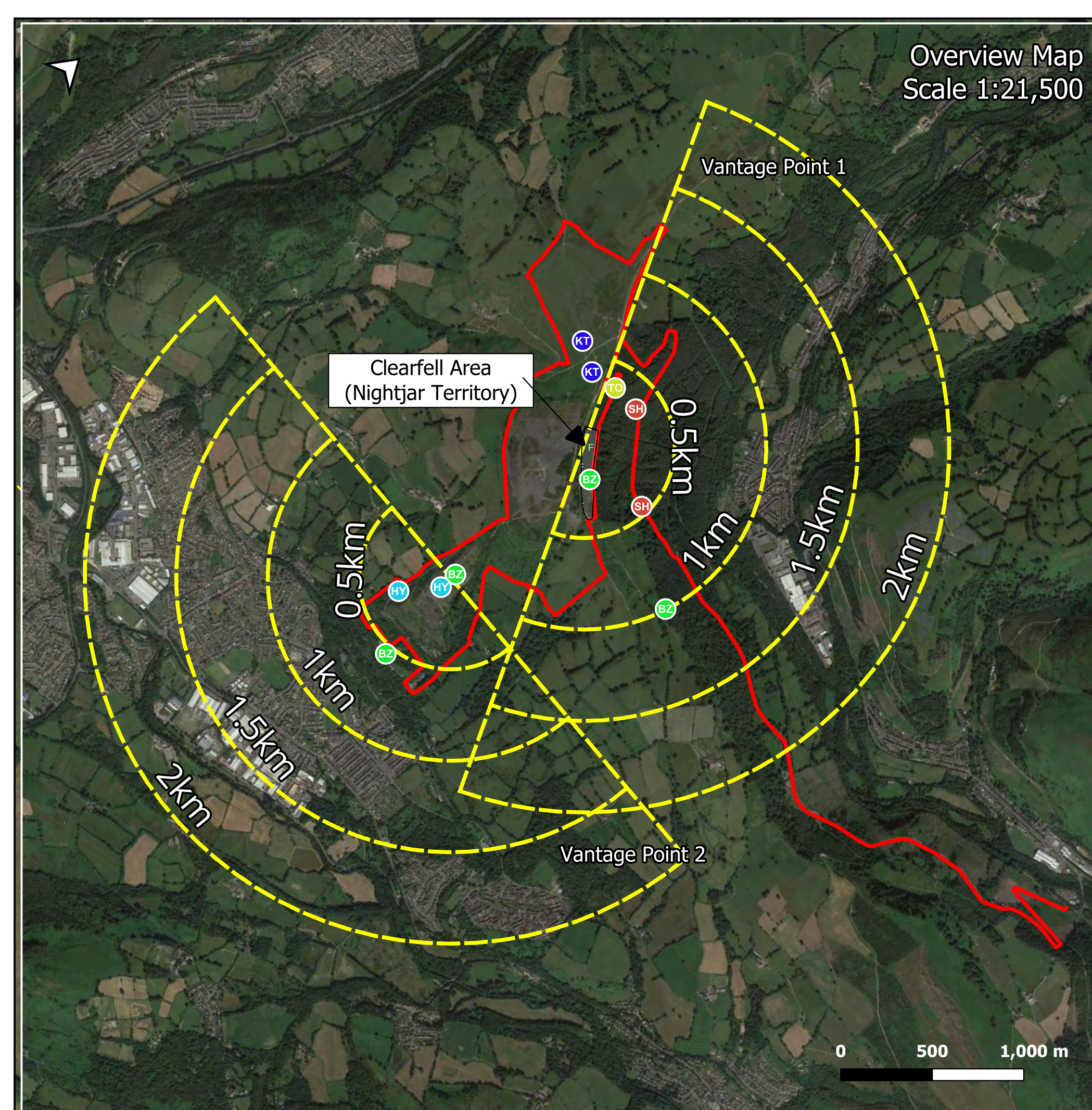


## Drawings

GC4277-WSP-74-XX-M2-L-3008 – Evening Vantage Point Survey Results Map

GC4277-WSP-74-XX-M2-L-3009 – Ground-nesting Birds and Raptor Nest Survey Results Map

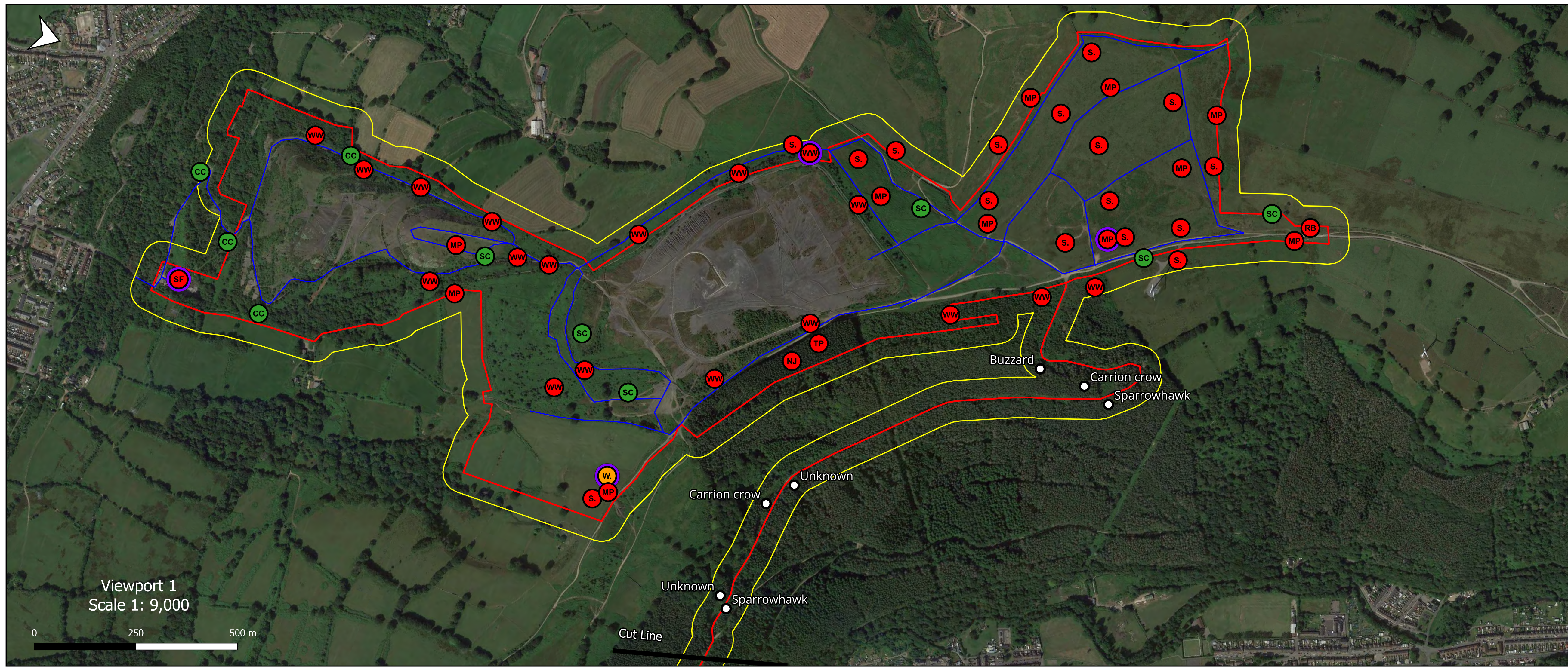




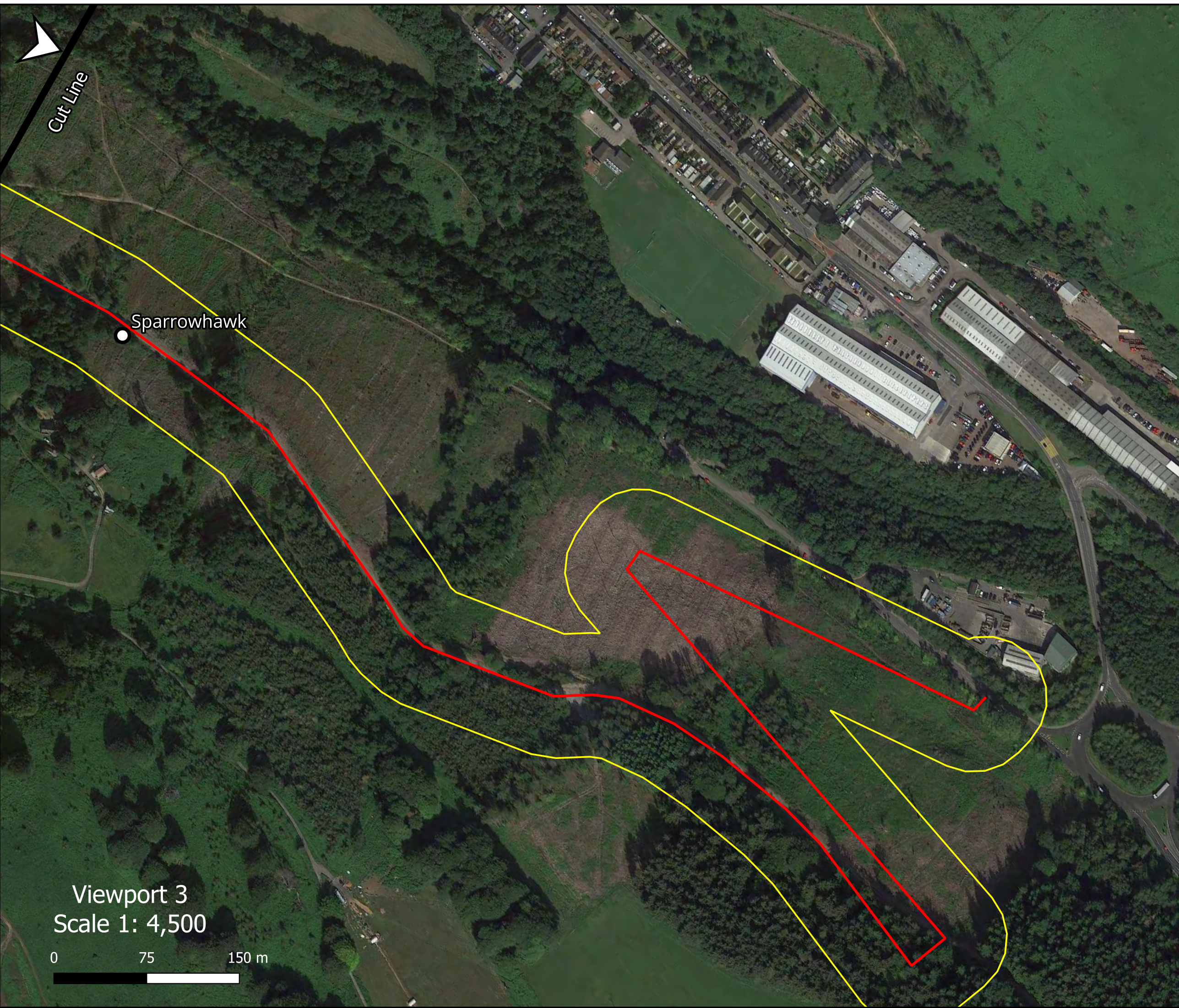
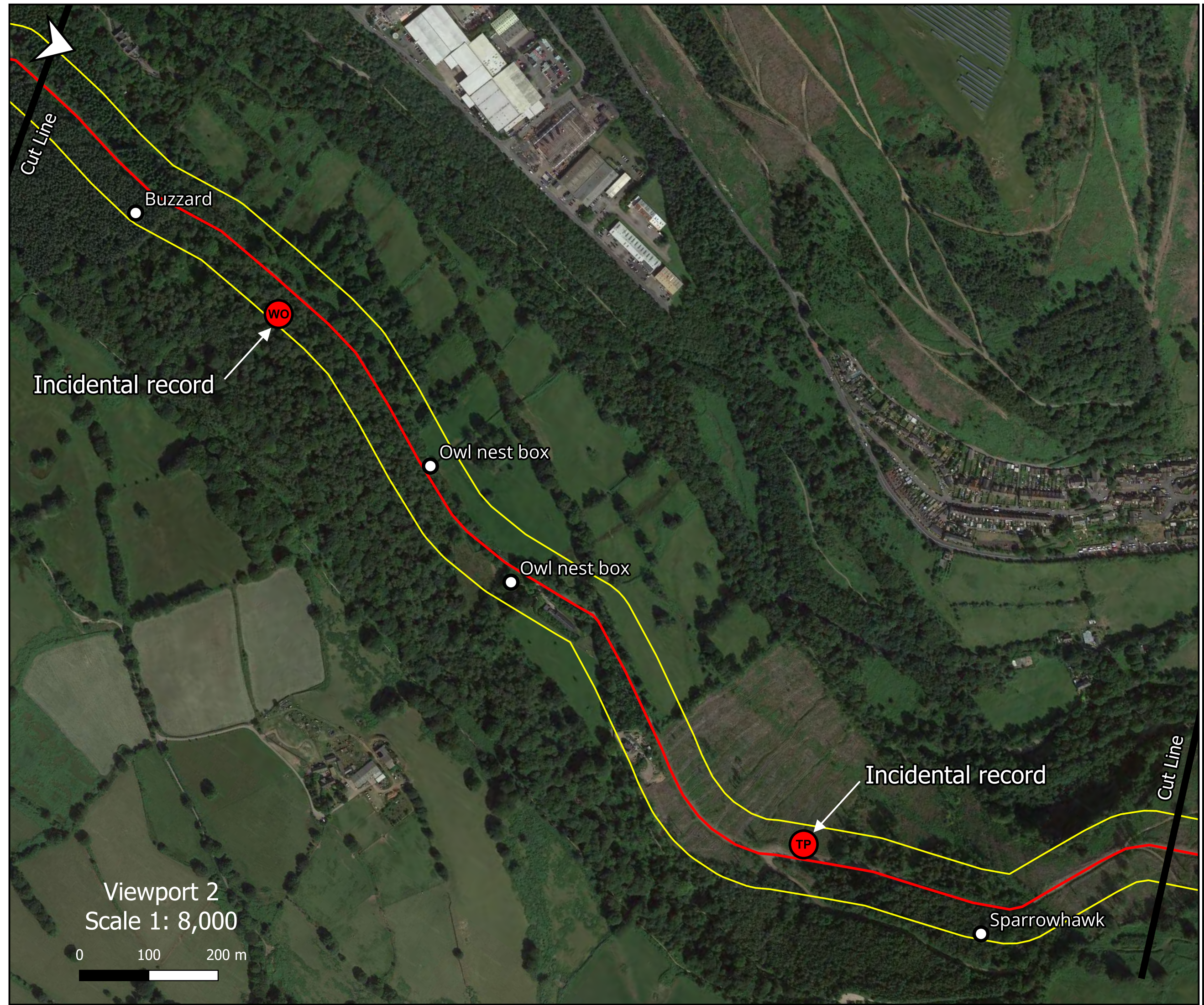
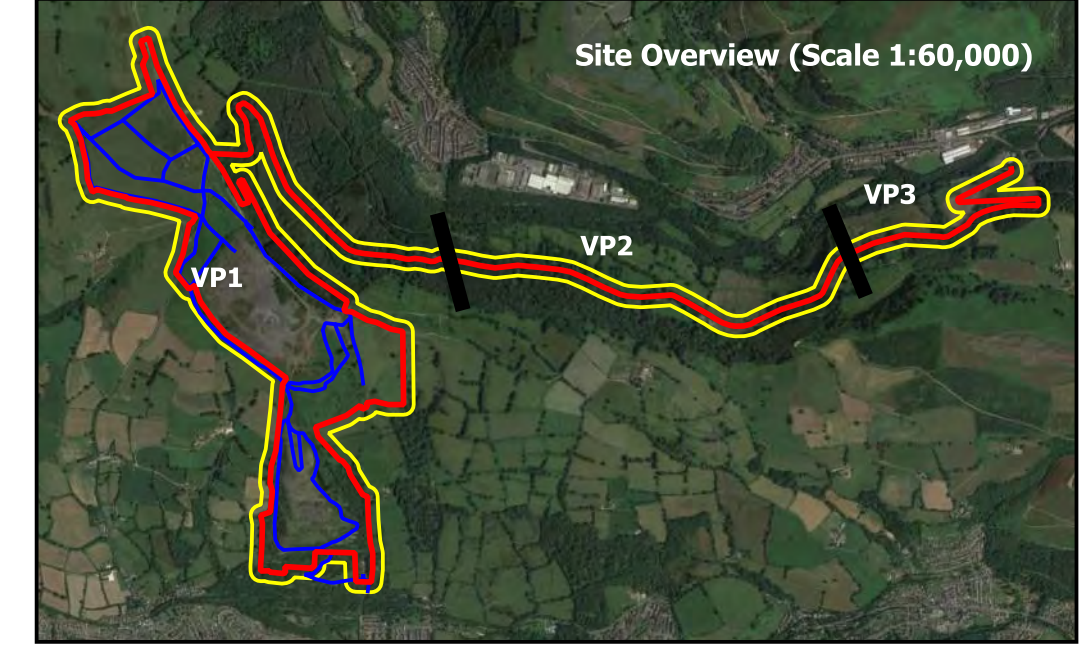
- Key:
- BZ - Buzzard
  - HY - Hobby
  - KT - Red Kite
  - SH - Sparrowhawk
  - TO - Tawny Owl
  - Vantage Points
  - Flight lines for direction (white on map)
  - Redlone Boundary
- Clearfell Area:
- Coniferous woodland - recently felled

|  |              |              |        |               |            |
|--|--------------|--------------|--------|---------------|------------|
| P01  | NP           | TO           | GP     | First Issue.  | 19/12/2023 |
| Rev  | Drwn         | Chk'd        | Appr'd | Description   | Date       |
| Purpose of issue   |              |              |        |               |            |
| <b>S2 - Issued for Information</b>   |              |              |        |               |            |
| Classification   |              |              |        |               |            |
| <b>Confidential</b>  |              |              |        |               |            |
| Client   |              |              |        |               |            |
| <b>Energy Recovery Investments</b>   |              |              |        |               |            |
| Project  |              |              |        |               |            |
| <b>Bedwas Tips</b>   |              |              |        |               |            |
| Drawing Title  |              |              |        |               |            |
| <b>Evening Vantage Point Survey Results Map</b>                                  |              |              |        |               |            |
| Drawn  | NP           | Checked      | TO     | Approved      | GP         |
| Project No   | Date         | Scale        | Size   |               |            |
| GC/004420  | October 2023 | See Viewport | A1     |               |            |
| Drawing identifier   |              |              |        | Revision: P01 |            |
| <b>GC4420-WSP-74-XX-M2-L-3008</b>  |              |              |        |               |            |
|  |              |              |        |               |            |
| Quest House, St Mellons Business Park, Fortran Rd, St. Mellons, Cardiff, CF3 0EY |              |              |        |               |            |





- Key:**
- Redline Boundary
  - 50m Survey Boundary
  - Transect route
  - Possible Raptor Nest Sites
  - Confirmed Nest Sites
- Conservation Concern:**
- Low
  - Medium
  - High
- Abbreviations:**
- CC - Chiffchaff
  - MP - Meadow Pipit
  - NJ - Nightjar
  - RB - Reed Bunting
  - S. - Skylark
  - SC - Stonechat
  - SF - Spotted Flycatcher
  - TP - Tree Pipit
  - W. - Wheatear
  - WO - Wood Warbler
  - WW - Willow Warbler



|  |              |               |       |               |            |
|--|--------------|---------------|-------|---------------|------------|
| P01  | NP           | TO            | GP    | First Issue.  | 19/12/2023 |
| Rev  | Drwn         | Chk'd         | App'd | Description   | Date       |
| Purpose of issue   |              |               |       |               |            |
| <b>S2 - Issued for Information</b>                               |              |               |       |               |            |
| Classification   |              |               |       |               |            |
| <b>Confidential</b>  |              |               |       |               |            |
| Client   |              |               |       |               |            |
| <b>Energy Recovery Investments</b>                               |              |               |       |               |            |
| Project  |              |               |       |               |            |
| <b>Bedwas Tip</b>  |              |               |       |               |            |
| Drawing Title  |              |               |       |               |            |
| <b>Ground-Nesting Birds &amp; Raptor Nest Survey Results Map</b> |              |               |       |               |            |
| Drawn  | NP           | Checked       | TO    | Approved      | GP         |
| Project No   | Date         | Scale         | Size  |               |            |
| GC/004277  | October 2023 | See Viewports | A1    |               |            |
| Drawing identifier   |              |               |       | Revision: P01 |            |
| <b>GC4277-WSP-74-XX-M2-L-3009</b>                                |              |               |       |               |            |



Quest House, St Mellons Business Park, Fortran Rd, St. Mellons, Cardiff, CF3 0EY



# Appendix A

## **SURVEY DATA**





### Evening Vantage Point survey data

| Survey & surveyors  | Date       | Start time | Finish time | Survey conditions   |
|---|------------|------------|-------------|---|
| 1 – Tip 2 (VP1)<br>Richard Poole<br>(Principal Ecologist)<br>Tara Okon<br>(Ecologist) | 13 04 2023 | 17:06      | 20:06       | Temp: 9°C<br>Cloud 4/8<br>Wind: 4<br>Precipitation: None<br>Visibility: Good  |
| 2 – Tip 1 (VP2)<br>Charlotte Gurney-<br>Read (Ecologist)<br>Tara Okon<br>(Ecologist)  | 17 05 2023 | 18:01      | 21:01       | Temp: 14°C<br>Cloud 4/8<br>Wind: 4<br>Precipitation: None<br>Visibility: Good |
| 3 – VP1<br>Richard Poole<br>(Principal Ecologist)<br>Tara Okon<br>(Ecologist)         | 14 06 2023 | 19:31      | 22:31       | Temp: 25°C<br>Cloud 0/8<br>Wind: 2<br>Precipitation: None<br>Visibility: Good |
| 4 – VP2<br>Richard Poole<br>(Principal Ecologist)<br>Tara Okon<br>(Ecologist)         | 04 08 2023 | 17:56      | 20:56       | Temp: 19°C<br>Cloud 4/8<br>Wind: 2<br>Precipitation: None<br>Visibility: Good |

### Ground-nesting bird & daytime raptor survey data

| Survey & surveyors  | Date       | Start time | Finish time | Survey conditions   |
|---|------------|------------|-------------|---|
| 1<br>Richard Poole<br>(Principal Ecologist)<br>Tara Okon<br>(Ecologist) | 11 04 2023 | 06:30      | 09:55       | Temp: 7 °C<br>Cloud 4/8<br>Wind: 4<br>Precipitation: Light<br>rain shower.<br>Visibility: Good                            |
| 2<br>Tara Okon<br>(Ecologist)<br>Charlotte Gurney-<br>Read (Ecologist)  | 16 05 2023 | 05:30      | 10:15       | Temp: 7 °C<br>Cloud 4/8<br>Wind: 2<br>Precipitation: None<br>Visibility: Good   |
| 3<br>Tara Okon<br>(Ecologist)<br>Charlotte Gurney-<br>Read (Ecologist)  | 13 06 2023 | 05:15      | 09:50       | Temp: 14°C<br>Cloud 4/8<br>Wind: 0<br>Precipitation: None<br>Visibility: Good   |
| 4<br>Tara Okon<br>(Ecologist)<br>Megan Watts<br>(Ecologist)             | 28 07 2023 | 05:15      | 09:15       | Temp: 14°C<br>Cloud 8/8<br>Wind: 4<br>Precipitation: Light<br>rain showers.<br>Visibility: Good (poor<br>at survey start) |

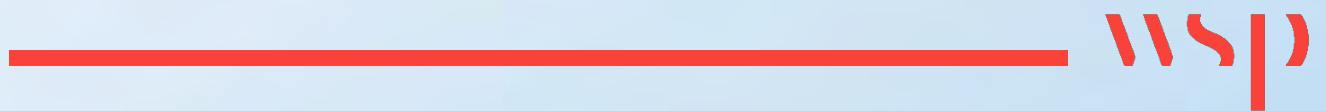
Key: Cloud: scale 0 - 8, 0 = clear skies, 4 = 50% cover, 8 = complete cloud cover

Wind: Beaufort scale 0 – 12 , 0 = calm, 2 = light breeze, 4 = moderate breeze, 6 = strong breeze, 7 = Moderate gale, 9 =Strong gale 12 = Hurricane



# Appendix B

## FULL BIRD SPECIES LIST





**Full list of bird species recorded in survey area.**

| Common name              | Scientific name              | WCA<br>Schedule 1 | SPI Wales | UK Red list | UK Amber<br>list | Wales Red<br>list | Wales<br>Amber list |
|--------------------------|------------------------------|-------------------|-----------|-------------|------------------|-------------------|---------------------|
| Mallard                  | <i>Anas platyrhynchos</i>    |                   |           |             | *                |                   |                     |
| Nightjar                 | <i>Caprimulgus europaeus</i> |                   | *         |             | *                |                   |                     |
| Swift                    | <i>Apus apus</i>             |                   |           | *           |                  | *                 |                     |
| Cuckoo                   | <i>Cuculus canorus</i>       |                   | *         | *           |                  | *                 |                     |
| Feral pigeon             | <i>Columba livia</i>         |                   |           |             |                  |                   |                     |
| Stock dove               | <i>Columba oenas</i>         |                   |           |             | *                |                   |                     |
| Woodpigeon               | <i>Columba palumbus</i>      |                   |           |             | *                |                   |                     |
| Herring gull             | <i>Larus argentatus</i>      |                   | *         | *           |                  | *                 |                     |
| Lesser black-backed gull | <i>Larus fuscus</i>          |                   |           |             | *                | *                 |                     |
| Grey heron               | <i>Ardea cinerea</i>         |                   |           |             |                  |                   | *                   |
| Sparrowhawk              | <i>Accipiter nisus</i>       |                   |           |             | *                |                   |                     |
| Red kite                 | <i>Milvus milvus</i>         | *                 |           |             |                  |                   |                     |
| Buzzard                  | <i>Buteo buteo</i>           |                   |           |             |                  |                   |                     |
| Tawny owl                | <i>Strix aluco</i>           |                   |           |             | *                |                   |                     |
| Great spotted woodpecker | <i>Dendrocopos major</i>     |                   |           |             |                  |                   |                     |
| Green woodpecker         | <i>Picus viridis</i>         |                   |           |             |                  |                   | *                   |
| Kestrel                  | <i>Falco tinnunculus</i>     |                   | *         |             | *                | *                 |                     |
| Hobby                    | <i>Falco subbuteo</i>        | *                 |           |             |                  |                   |                     |
| Peregrine                | <i>Falco peregrinus</i>      | *                 |           |             |                  |                   |                     |





| Common name     | Scientific name                | WCA<br>Schedule 1 | SPI Wales | UK Red list | UK Amber<br>list | Wales Red<br>list | Wales<br>Amber list |
|-----------------|--------------------------------|-------------------|-----------|-------------|------------------|-------------------|---------------------|
| Jay             | <i>Garrulus glandarius</i>     |                   |           |             |                  |                   |                     |
| Magpie          | <i>Pica pica</i>               |                   |           |             |                  |                   | *                   |
| Jackdaw         | <i>Coloeus monedula</i>        |                   |           |             |                  |                   |                     |
| Carrion crow    | <i>Corvus corone</i>           |                   |           |             |                  |                   |                     |
| Raven           | <i>Corvus corax</i>            |                   |           |             |                  |                   |                     |
| Coal tit        | <i>Periparus ater</i>          |                   |           |             |                  |                   | *                   |
| Blue tit        | <i>Cyanistes caeruleus</i>     |                   |           |             |                  |                   |                     |
| Great tit       | <i>Parus major</i>             |                   |           |             |                  |                   |                     |
| Skylark         | <i>Alauda arvensis</i>         |                   | *         | *           |                  |                   | *                   |
| Sand martin     | <i>Riparia riparia</i>         |                   |           |             |                  |                   |                     |
| Swallow         | <i>Hirundo rustica</i>         |                   |           |             |                  |                   |                     |
| House martin    | <i>Delichon urbicum</i>        |                   |           | *           |                  |                   | *                   |
| Long-tailed tit | <i>Aegithalos caudatus</i>     |                   |           |             |                  |                   |                     |
| Wood warbler    | <i>Phylloscopus sibilatrix</i> |                   | *         | *           |                  | *                 |                     |
| Willow warbler  | <i>Phylloscopus trochilus</i>  |                   |           |             | *                | *                 |                     |
| Chiffchaff      | <i>Phylloscopus collybita</i>  |                   |           |             |                  |                   |                     |
| Blackcap        | <i>Sylvia atricapilla</i>      |                   |           |             |                  |                   |                     |
| Garden warbler  | <i>Sylvia borin</i>            |                   |           |             |                  |                   | *                   |
| Whitethroat     | <i>Curruca communis</i>        |                   |           |             | *                | *                 |                     |



| Common name        | Scientific name                | WCA<br>Schedule 1 | SPI Wales | UK Red list | UK Amber<br>list | Wales Red<br>list | Wales<br>Amber list |
|--------------------|--------------------------------|-------------------|-----------|-------------|------------------|-------------------|---------------------|
| Goldcrest          | <i>Regulus regulus</i>         |                   |           |             |                  | *                 |                     |
| Wren               | <i>Troglodytes troglodytes</i> |                   |           |             | *                |                   |                     |
| Nuthatch           | <i>Sitta europaea</i>          |                   |           |             |                  |                   |                     |
| Treecreeper        | <i>Certhia familiaris</i>      |                   |           |             |                  |                   |                     |
| Starling           | <i>Sturnus vulgaris</i>        |                   | *         | *           |                  | *                 |                     |
| Song thrush        | <i>Turdus philomelos</i>       |                   | *         |             | *                |                   |                     |
| Mistle thrush      | <i>Turdus viscivorus</i>       |                   |           | *           |                  |                   | *                   |
| Redwing            | <i>Turdus iliacus</i>          | *                 |           |             | *                |                   |                     |
| Blackbird          | <i>Turdus merula</i>           |                   |           |             |                  |                   |                     |
| Fieldfare          | <i>Turdus pilaris</i>          | *                 |           | *           |                  |                   |                     |
| Spotted flycatcher | <i>Muscicapa striata</i>       |                   | *         | *           |                  | *                 |                     |
| Robin              | <i>Erithacus rubecula</i>      |                   |           |             |                  |                   |                     |
| Redstart           | <i>Phoenicurus phoenicurus</i> |                   |           |             | *                |                   |                     |
| Stonechat          | <i>Saxicola rubicola</i>       |                   |           |             |                  |                   |                     |

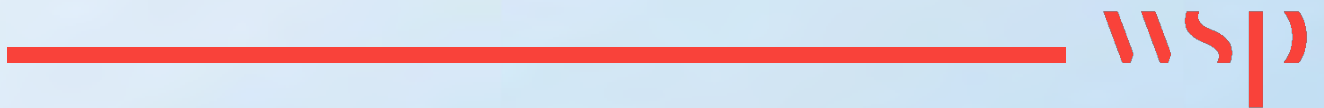




| Common name   | Scientific name             | WCA<br>Schedule 1 | SPI Wales | UK Red list | UK Amber<br>list | Wales Red<br>list | Wales<br>Amber list |
|---------------|-----------------------------|-------------------|-----------|-------------|------------------|-------------------|---------------------|
| Wheatear      | <i>Oenanthe oenanthe</i>    |                   |           |             | *                |                   | *                   |
| House sparrow | <i>Passer domesticus</i>    |                   | *         | *           |                  |                   | *                   |
| Dunnock       | <i>Prunella modularis</i>   |                   | *         |             | *                |                   | *                   |
| Grey wagtail  | <i>Motacilla cinerea</i>    |                   |           |             | *                |                   | *                   |
| Pied wagtail  | <i>Motacilla alba</i>       |                   |           |             |                  |                   |                     |
| Meadow pipit  | <i>Anthus pratensis</i>     |                   |           |             | *                | *                 |                     |
| Tree pipit    | <i>Anthus trivialis</i>     |                   | *         | *           |                  | *                 |                     |
| Chaffinch     | <i>Fringilla coelebs</i>    |                   |           |             |                  |                   | *                   |
| Bullfinch     | <i>Pyrrhula pyrrhula</i>    |                   | *         |             | *                |                   |                     |
| Greenfinch    | <i>Chloris chloris</i>      |                   |           | *           |                  | *                 |                     |
| Linnet        | <i>Linaria cannabina</i>    |                   | *         | *           |                  | *                 |                     |
| Goldfinch     | <i>Carduelis carduelis</i>  |                   |           |             |                  |                   |                     |
| Siskin        | <i>Spinus spinus</i>        |                   |           |             |                  |                   |                     |
| Reed bunting  | <i>Emberiza schoeniclus</i> |                   | *         |             | *                |                   |                     |

# Appendix C

## **LEGISLATION AND CONSERVATION DESIGNATIONS**





## **BIRDS DIRECTIVE (DIRECTIVE 2009/147/EC)**

Annex 1 of the Birds Directive lists species and sub-species which are:

- in danger of extinction;
- vulnerable to specific changes in their habitat;
- considered rare because of small populations or restricted local distribution;
- requiring particular attention for reasons of the specific nature of habitat.

For these species Member States must conserve their most suitable territories in number and size as Special Protection Areas (SPAs). Species listed on Annex 1 of the Birds Directive include kingfisher and red kite.

## **WILDLIFE AND COUNTRYSIDE ACT 1981 (AS AMENDED)**

### **SCHEDULE 1**

All naturally occurring British bird species are protected under the Wildlife and Countryside Act 1981 (as amended). The legislation protects all birds, their nests and eggs and it is an offence to:

- intentionally kill, injure and take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; or
- intentionally take or destroy the egg of any wild bird.

Birds listed on Schedule 1 of the above legislation (e.g., kingfisher and red kite) are afforded further protection and it is an offence to:

- intentionally or recklessly disturb the bird while nest building or while at (or near) a nest with eggs or young; or
- disturb the dependent young of such a bird.

## **ENVIRONMENT (WALES) ACT 2016**

Section 7 of the Environment (Wales) Act 2016 lists the living organisms and types of habitat in Wales which are considered to be of key significance to sustain and improve biodiversity in relation to Wales.

The Act states that Welsh Ministers must take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section, and encourage others to take such steps.

## **RED AND AMBER LISTS**

Red-listed bird species are those which:

Are globally threatened;

- Have suffered a historical population decline in the UK during 1800–1995;
- Have suffered a severe (at least 50%) decline in the UK breeding population over the last 25 years, or longer-term period (the entire period used for assessments since the first review, starting in 1969);
- Have suffered a severe (at least 50%) contraction of the UK breeding range over the last 25 years, or the longer-term period;



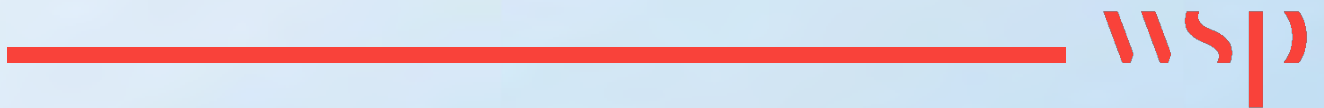


Amber-listed bird species are those which:

- Have unfavourable conservation status in Europe (SPEC = Species of European Conservation Concern)
- Have suffered a historical population decline during 1800–1995, but recovering; population size has more than doubled over last 25 years
- Have suffered a moderate (25-49%) decline in the UK breeding population over the last 25 years, or the longer-term period
- Have suffered a moderate (25-49%) contraction of the UK breeding range over last 25 years, or the longer-term period
- Have suffered a moderate (25-49%) decline in the UK non-breeding population over last 25 years, or the longer-term period
- Are rare breeders; 1–300 breeding pairs in UK
- Are rare non-breeders; less than 900 individuals
- Are localised; at least 50% of the UK breeding or non-breeding population in 10 or fewer sites, but not applied to rare breeders or non-breeders
- Are internationally important; at least 20% of European breeding or non-breeding population in UK (NW European and East Atlantic Flyway populations used for non-breeding wildfowl and waders respectively)

# Appendix D

## **NATURE CONSERVATION VALUE – DEFINITION OF TERMS**





The examples selected for each Nature Conservation Value level are for general guidance and other considerations may apply, for example species of low value in isolation but subject to widespread national decline may be afforded higher Nature Conservation Values in some cases. The Nature Conservation Value levels are adapted from CIEEM (2016) and have been outlined to be specific to birds.

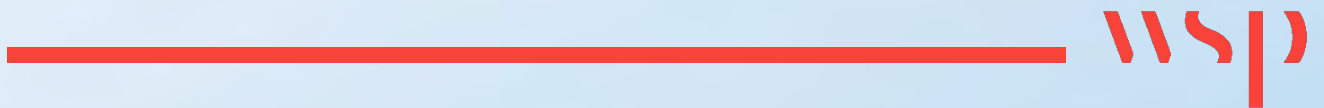
### Nature conservation value- definition of terms

| Nature Conservation Value | Selection criteria (examples)   |
|---------------------------|---|
| International             | Species cited as part of a SPA and which regularly occurs in internationally or nationally important numbers (i.e. >1% of international population).  |
| National                  | Species cited as part of a SSSI and which regularly occurs in nationally or regionally important numbers. A nationally important assemblage of breeding or overwintering species. A species present in nationally important numbers (i.e. >1% of UK population). Rare breeding species (<300 breeding pairs in UK). |
| Regional                  | Section 7 priority species not covered above and regularly occurring in regionally important numbers. (>1% of regional population).<br>Species on BoCCW4 and /or BoCCUK5 Red list and regularly occurring in regionally important numbers.  |
| County/Metropolitan       | Section 7 priority species not covered above and regularly occurring in county important numbers (>1% of county population).<br>Species on the BoCCW4 and /or BoCCUK5 and regularly occurring in county important numbers.  |
| District                  | Section 7 species not covered above and are rare in the locality.<br>Species present in just short of county important numbers.<br>Sustainable populations of rare or scarce species in the locality.   |
| Local                     | Other section 7 species not covered above and species on the Red and Amber BoCCW4 /BoCCUK5 lists regularly occurring in locally sustainable populations.  |
| Site                      | All other BoCCW4 and /or BoCCUK5 Green listed common and widespread species.<br>Low numbers of Amber or Red listed species.   |



# Appendix E

## **BREEDING BIRDS OF HIGH AND MEDIUM CONSERVATION CONCERN - COUNTY STATUS**

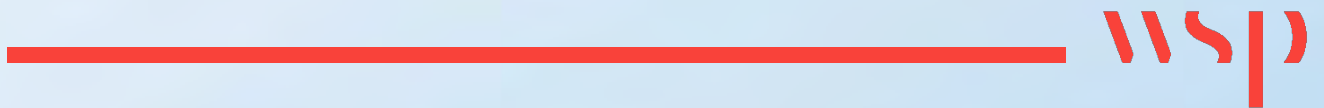


## Breeding birds of high and medium conservation concern- county status

| Common name        | Scientific name                | Status in Gwent  |
|--------------------|--------------------------------|--|
| Nightjar           | <i>Caprimulgus europaeus</i>   | Uncommon breeding summer visitor.  |
| Cuckoo             | <i>Cuculus canorus</i>         | Fairly common breeding summer visitor.   |
| Sparrowhawk        | <i>Accipiter nisus</i>         | Common breeding resident.  |
| Goshawk            | <i>Accipiter gentilis</i>      | Uncommon breeding resident.  |
| Red kite           | <i>Milvus milvus</i>           | Scarce visitor and passage migrant; rare breeding resident.                      |
| Barn owl           | <i>Tyto alba</i>               | Uncommon breeding resident; some possibly as a result of introductions.          |
| Tawny owl          | <i>Strix aluco</i>             | Common breeding resident.  |
| Kestrel            | <i>Falco tinnunculus</i>       | Fairly common breeding resident, though marked decline in last two decades.      |
| Hobby              | <i>Falco subbuteo</i>          | Breeding summer visitor.   |
| Peregrine          | <i>Falco peregrinus</i>        | Resident and winter visitor.   |
| Skylark            | <i>Alauda arvensis</i>         | Fairly common to common breeding resident and passage migrant.                   |
| Wood warbler       | <i>Phylloscopus sibilatrix</i> | Fairly common summer visitor; typically arriving mid-Apr.                        |
| Willow warbler     | <i>Phylloscopus trochilus</i>  | Common breeding summer visitor and passage migrant.                              |
| Chiffchaff         | <i>Phylloscopus collybita</i>  | Common breeding summer visitor and passage migrant; scarce winter visitor.       |
| Spotted flycatcher | <i>Muscicapa striata</i>       | Uncommon breeding summer visitor.  |
| Stonechat          | <i>Saxicola rubicola</i>       | Uncommon breeding resident and winter visitor; breeding range expanding.         |
| Wheatear           | <i>Oenanthe oenanthe</i>       | Fairly common breeding summer visitor, passage migrant, typical arrival mid-Mar. |
| Meadow pipit       | <i>Anthus pratensis</i>        | Common breeding resident and passage migrant.                                    |
| Tree pipit         | <i>Anthus trivialis</i>        | Common passage migrant/breeding summer visitor; typical arrival mid-Apr.         |
| Reed bunting       | <i>Emberiza schoeniclus</i>    | Fairly common breeding resident and winter visitor.                              |

# Appendix F

**DESKTOP STUDY DATA (SEWBREC)**







### Protected and priority bird species records within 1 km of the Scheme.

| Common Name    | Scientific Name                 | Legislation / Conservation Status                        | No. of Records | Most Recent Record |
|----------------|---------------------------------|--|----------------|--------------------|
| Brambling      | <i>Fringilla montifringilla</i> | WCA1.1, WBAm(RSPB)                                       | 1              | December 2018      |
| Bullfinch      | <i>Pyrrhula pyrrhula</i>        | S7, WBR(RSPB), LBAP (CLY), UKBAm(RSPB)                   | 12             | June 2020          |
| Crossbill      | <i>Loxia curvirostra</i>        | WCA1.1, Bern   | 2              | January 2020       |
| Cuckoo         | <i>Cuculus canorus</i>          | S7, WBR(RSPB), UKBR(RSPB)                                | 10             | April 2021         |
| Dunnock        | <i>Prunella modularis</i>       | S7, Bern, UKBAm(RSPB)                                    | 100            | June 2021          |
| Fieldfare      | <i>Turdus pilaris</i>           | BDir22, WCA1.1, WBAm(RSPB), UKBR(RSPB)                   | 2              | February 2021      |
| Firecrest      | <i>Regulus ignicapilla</i>      | WCA1.1, Bern, WBAm(RSPB)                                 | 1              | September 2015     |
| Goshawk        | <i>Accipiter gentilis</i>       | WCA1.1, WCA9, CITES, LBAP (CLY)                          | 5              | October 2021       |
| Herring gull   | <i>Larus argentatus</i>         | BDir22, S7, WBR(RSPB), UKBR(RSPB)                        | 40             | November 2020      |
| Hobby          | <i>Falco subbuteo</i>           | WCA1.1, Bern, CITES                                      | 2              | July 2016          |
| House sparrow  | <i>Passer domesticus</i>        | S7, WBAm(RSPB), UKBR(RSPB)                               | 212            | June 2021          |
| Kestrel        | <i>Falco tinnunculus</i>        | S7, Bern, CITES, WBR(RSPB), UKBAm(RSPB)                  | 5              | September 2021     |
| Kingfisher     | <i>Alcedo atthis</i>            | BDir1, WCA1.1, Bern, LBAP (CLY), WBAm(RSPB), UKBAm(RSPB) | 13             | November 2020      |
| Lesser redpoll | <i>Acanthis cabaret</i>         | S7, LBAP (CON), WBAm(RSPB), UKBR(RSPB)                   | 11             | November 2020      |

|                    |                                |  |    |                |
|--------------------|--------------------------------|--|----|----------------|
| Linnet             | <i>Linaria cannabina</i>       | S7, Bern, WBR(RSPB), UKBR(RSPB)                      | 5  | September 2021 |
| Nightjar           | <i>Caprimulgus europaeus</i>   | BDir1, S7, Bern, LBAP (CLY), WBAm(RSPB), UKBAm(RSPB) | 4  | June 2017      |
| Peregrine          | <i>Falco peregrinus</i>        | BDir1, WCA1.1, Bern, CITES, LBAP (CLY),              | 6  | August 2021    |
| Pied flycatcher    | <i>Ficedula hypoleuca</i>      | S7, WBR(RSPB), UKBR(RSPB)                            | 1  | June 2018      |
| Red kite           | <i>Milvus milvus</i>           | BDir1, WCA1.1, WCA9, CITES, WBAm(RSPB)               | 12 | November 2021  |
| Redwing            | <i>Turdus iliacus</i>          | BDir22, WCA1.1, WBAm(RSPB), UKBR(RSPB)               | 46 | November 2021  |
| Reed bunting       | <i>Emberiza schoeniclus</i>    | S7, Bern, LBAP (CLY), WBAm(RSPB), UKBAm(RSPB)        | 4  | March 2016     |
| Skylark            | <i>Alauda arvensis</i>         | BDir22, S7, LBAP (CLY), WBAm(RSPB), UKBR(RSPB)       | 4  | September 2021 |
| Song thrush        | <i>Turdus philomelos</i>       | BDir22, S7, Bern, LBAP (CLY), WBAm(RSPB), UKBR(RSPB) | 48 | July 2021      |
| Spotted flycatcher | <i>Muscicapa striata</i>       | S7, Bern, WBR(RSPB), LBAP (CLY), UKBR(RSPB)          | 2  | September 2020 |
| Starling           | <i>Sturnus vulgaris</i>        | BDir22, S7, Bern, WBR(RSPB), UKBR(RSPB)              | 24 | September 2021 |
| Tree pipit         | <i>Anthus trivialis</i>        | S7, Bern, WBAm(RSPB), UKBR(RSPB)                     | 4  | April 2021     |
| Wood warbler       | <i>Phylloscopus sibilatrix</i> | S7, WBR(RSPB), UKBR(RSPB)                            | 2  | June 2018      |



## Bird species of Conservation Concern within 1 km

| Common name              | Scientific name            | Legislation/<br>Conservation Status       | No. of records | Most Recent Record |
|--------------------------|----------------------------|---|----------------|--------------------|
| Common gull              | <i>Larus canus</i>         | BDir22, WBR(RSPB), UKBAm(RSPB)            | 1              | January 2014       |
| Common sandpiper         | <i>Actitis hypoleucos</i>  | WBR(RSPB), UKBAm(RSPB)                    | 1              | June 2018          |
| Cormorant                | <i>Phalacrocorax carbo</i> | WBAm(RSPB)                                | 2              | November 2019      |
| Dipper                   | <i>Cinclus cinclus</i>     | Bern, LBAP (CLY), WBAm(RSPB), UKBAm(RSPB) | 21             | April 2021         |
| Goldcrest                | <i>Regulus regulus</i>     | Bern, WBAm(RSPB)                          | 22             | November 2020      |
| Great Black-backed Gull  | <i>Larus marinus</i>       | BDir22, WBR(RSPB), UKBAm(RSPB)            | 2              | August 2015        |
| Green woodpecker         | <i>Picus viridis</i>       | Bern, LBAP (CLY), WBAm(RSPB)              | 9              | March 2016         |
| Greenfinch               | <i>Chloris chloris</i>     | Bern, WBAm(RSPB)                          | 11             | May 2021           |
| Grey heron               | <i>Ardea cinerea</i>       | WBAm(RSPB)                                | 11             | October 2021       |
| Grey wagtail             | <i>Motacilla cinerea</i>   | Bern, LBAP (CLY), WBAm(RSPB), UKBR(RSPB)  | 24             | March 2021         |
| Lesser Black-backed Gull | <i>Larus fuscus</i>        | BDir22, WBAm(RSPB), UKBAm(RSPB)           | 81             | July 2019          |
| Long-tailed Tit          | <i>Aegithalos caudatus</i> | WBAm(RSPB)                                | 37             | April 2021         |
| Mallard                  | <i>Anas platyrhynchos</i>  | BDir21, WBAm(RSPB), UKBAm(RSPB)           | 19             | April 2021         |
| Meadow pipit             | <i>Anthus pratensis</i>    | Bern, WBAm(RSPB), UKBAm(RSPB)             | 7              | September 2021     |





|                |                                |  |    |                |
|----------------|--------------------------------|--|----|----------------|
| Mistle thrush  | <i>Turdus viscivorus</i>       | BDir22, Bern, WBAm(RSPB), UKBR(RSPB)   | 12 | June 2021      |
| Redstart       | <i>Phoenicurus phoenicurus</i> | Bern, WBAm(RSPB), UKBAm(RSPB)          | 13 | May 2020       |
| Shoveler       | <i>Spatula clypeata</i>        | BDir21, CITES, WBAm(RSPB), UKBAm(RSPB) | 3  | July 2021      |
| Snipe          | <i>Gallinago gallinago</i>     | BDir21, WBAm(RSPB), UKBAm(RSPB)        | 1  | November 2018  |
| Swallow        | <i>Hirundo rustica</i>         | Bern, WBAm(RSPB)                       | 5  | September 2021 |
| Swift          | <i>Apus apus</i>               | WBAm(RSPB), UKBAm(RSPB)                | 51 | September 2021 |
| Wheatear       | <i>Oenanthe oenanthe</i>       | Bern, WBAm(RSPB)                       | 28 | May 2021       |
| Whitethroat    | <i>Curruca communis</i>        | WBR(RSPB)                              | 4  | April 2020     |
| Willow warbler | <i>Phylloscopus trochilus</i>  | WBR(RSPB), UKBAm(RSPB)                 | 8  | June 2018      |
| Woodcock       | <i>Scolopax rusticola</i>      | BDir21, WBR(RSPB), UKBR(RSPB)          | 28 | April 2021     |

**Table F-1 – Bird Species of Local Concern within 1 km**

| <b>Common name</b> | <b>Scientific name</b> | <b>Legislation/<br/>Conservation Status</b> | <b>No. of records</b> | <b>Most Recent Record</b> |
|--------------------|------------------------|---|-----------------------|---------------------------|
| Buzzard            | <i>Buteo buteo</i>     | CITES, LBAP[CLY]                            | 22                    | September 2021            |

### Legislation Abbreviations

|            |   |        |  |
|------------|---|--------|--|
| BDir1      | EU Birds Directive Annexe 1   | S7     | Environment (Wales) Act 2016 (Section 7)   |
| BDir2.1    | EU Birds Directive Annexe 2.1   | UKBA   | RSPB UK Birds Amber List (not based on IUCN criteria)  |
| BDir2.2    | EU Birds Directive Annexe 2.2   | UKBR   | RSPB UK Birds Red List (not based on IUCN criteria)  |
| Bern       | Bern Convention on the Conservation of European Wildlife and Natural Habitats   | WBA    | RSPB Welsh Birds Amber List (not based on IUCN criteria)   |
| CITES      | Convention on International Trade in Endangered Species of Wild Fauna and Flora | WBR    | RSPB Welsh Birds Red List (not based on IUCN criteria)   |
| HDir       | EU Habitats Directive   | WCA1.1 | Wildlife & Countryside Act 1981 Schedule 1.1 (Birds which are protected at all times)                        |
| LBAP       | Local Biodiversity Action Plan species for the listed area                      | WCA1.2 | Wildlife & Countryside Act 1981 Schedule 1.2 (Birds which are protected at certain times)                    |
| LBAP [CLY] | Caerphilly County Borough Council Local Biodiversity Action Plan                | WCA9   | Wildlife & Countryside Act 1981 Schedule 9 (Non-native animals and plants which are established in the wild) |

# Appendix G

## PHOTOGRAPHS





### Supporting photographs



1. Panoramic view from Tip 2 VP1 (April 2023)



2. Panoramic view from Tip 1 VP2 (March 2023)



3. Clearfell area north-east of Tip 2 (VP1) (June 2023)







4. Clearfell area north-east of Tip 2 (VP1) (June 2023)



5. Cattle/sheep grazed open grassland on Mynydd Y Grug common, north-west of Tip 2 (June 2023)



6. Open grassland of Mynydd y Grug common, north-west of Tip 2 (April 2023)

|  |  |
|--|--|
|   |    |
| <p>7. Pond at northermost extent of Scheme in Mynydd y Grug SINC (June 2023)</p>   | <p>8. Acid grassland, heathland, and lichen/bryophyte mosaic on westerly slope of Tip 2 (June 2023)</p>  |
|  |   |
| <p>9. Continous bracken west of Tip 2 (June 2023)</p>                              | <p>10. Poor-semi improved and improved grassland east of Tip 2. Wheatear nest (red circle) in stone wall embedded in grass bank (May 2023)</p> |



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**wsp.com**

CONFIDENTIAL



# V3-S09/0008

## **TERRESTRIAL INVERTEBRATES SURVEY REPORT**





Energy Recovery Investments Ltd

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# **BEDWAS TIPS RECLAMATION**

Terrestrial Invertebrates Survey Report





Energy Recovery Investments Ltd

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# **BEDWAS TIPS RECLAMATION**

## Terrestrial Invertebrates Survey Report

**TYPE OF DOCUMENT (VERSION) CONFIDENTIAL**

**PROJECT NO. GC4277**

**OUR REF. NO. GC4277-WSP-74-XX-RP-L-0003**

**DATE: DECEMBER 2023**

WSP

1st Floor, Quest House  
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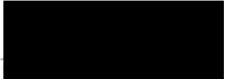
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# QUALITY CONTROL

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| Issue/revision | First issue   | Revision 1 | Revision 2 | Revision 3 |
|----------------|---|------------|------------|------------|
| Remarks        |   |            |            |            |
| Date           | 19 December 2023  |            |            |            |
| Prepared by    | Tara Okon (Ecologist)   |            |            |            |
| Signature      |    |            |            |            |
| Checked by     | Trevor Fletcher (Senior Ecologist)  |            |            |            |
| Signature      |    |            |            |            |
| Authorised by  | Geraint Pitman (Associate Director)   |            |            |            |
| Signature      |  |            |            |            |
| Project number | GC4277  |            |            |            |
| Report number  | GC4277-WSP-74-XX-RP-L-0003 – P01  |            |            |            |
| File reference | GC4277-WSP-74-XX-RP-L-0003  |            |            |            |



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# EXECUTIVE SUMMARY

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WSP UK Ltd (WSP) was commissioned by Energy Recovery Investments Ltd to carry out a terrestrial invertebrate survey for the proposed Bedwas Tips Reclamation Scheme, north of Bedwas, Caerphilly Borough (Approximate Central Grid Reference: ST 17668 90526).

Two visits over two consecutive days during June and July 2023 were undertaken to provide a preliminary overview of the diversity of invertebrate species within the Scheme with particular focus on protected/Priority species and species identified as of Local Concern.

A total of 17 different Priority species as well as 16 species of Local Concern were returned via SEWBRc data searches within 1km of the Scheme. Habitats searched were those considered most likely to support these 'target' species. As such patches of marshy grassland; dense scrub; broadleaved woodland; bracken; acid grassland, heathland, and lichen/bryophyte mosaic; as well as pond margins were searched.

A total of 199 terrestrial invertebrate species were recorded during the survey of which 167 were identified to species level. Ten Priority species were identified including four target species. Six species of Local Concern were also recorded.

Priority species outside of the target species comprised red-necked footman (moth) and bee chafer (beetle) of 'Local' distribution; the S7 and Red Data Book (UK) vulnerable species, grayling (butterfly); and the Nationally Scarce, red-tipped clearwing (moth) and Western bee-fly.

Generally, species recorded including those of Priority or Local Concern, were reliant on commonly occurring habitats/ plant species which were abundant within the Scheme and wider landscape.

Data search results indicate that no legally protected invertebrate species were considered likely to be present however five S7 Environment (Wales) Act 2016 Priority species recorded. Public bodies therefore have an obligation to have regard for these species when carrying out their functions.

Recommendations include pollution prevention measures to safeguard retained (or created) water bodies for damselfly and dragonfly species of Local Concern; if reseeded/planting of grassland habitat undertaken a diverse mix of grass/plant species is recommended. Enhancements include creation of additional ponds, cattle/sheep proof fencing to safeguard existing and/or additional ponds, supplementary seeding/ plant plugs to include common bird's-foot-trefoil for dingy skipper, and brash piles to create additional habitat.

# 1 INTRODUCTION

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## 1.1 BACKGROUND

WSP was commissioned by Energy Recovery Investments Ltd to carry out terrestrial invertebrate surveys of the Bedwas Tips Reclamation Scheme area (henceforth, the Scheme), situated north of Bedwas, Caerphilly borough (Approximate Central Grid Reference: ST 17668 90526).

The purpose of the survey was to provide a preliminary overview of the diversity of invertebrate species within the Scheme with particular focus on protected/Priority species and species identified as of Local Concern.

This report includes details of the survey methodologies and results and contains recommendations for mitigation, compensation and/or enhancement measures.

### PROJECT BACKGROUND & PROPOSED WORKS

The Scheme is located north of the villages of Bedwas and Trethomas, in Caerphilly County Borough Council (CCBC) district. It covers an extensive area including two existing coal tips on Mynydd y Grug and a track connecting the northern tip site with the A467/B4251 roundabout.

Colliery spoil dominates the two tip sites while the track forming the proposed Haul Road is located largely within woodland habitats. Land use surrounding the tips comprises agricultural land with pockets of woodland. Cwmfelinfach village lies to the north-east separated from the Scheme by the wooded corridor of the Sirhowy River which flows roughly parallel to the Haul Road. The Scheme lies partially within statutory and non-statutory designated sites.

The purpose of the works is to restore the Caerphilly County Borough Council (CCBC) owned degraded land of the Bedwas coal spoil tips to a more natural habitat in keeping with the surrounding area. In the process, high ash coal will be extracted from the colliery spoil which will provide the means of funding the restoration. The land is to be suitable for upland grazing, thereby enhancing the natural environment and improving the resilience of ecosystems and ecological networks by:

- Re-landscaping in keeping with the natural character of the area;
- Improving site drainage and run-off water quality;
- Improving physical ground conditions and land stability; and
- Promoting soil recovery, revegetation, and enhanced biodiversity.

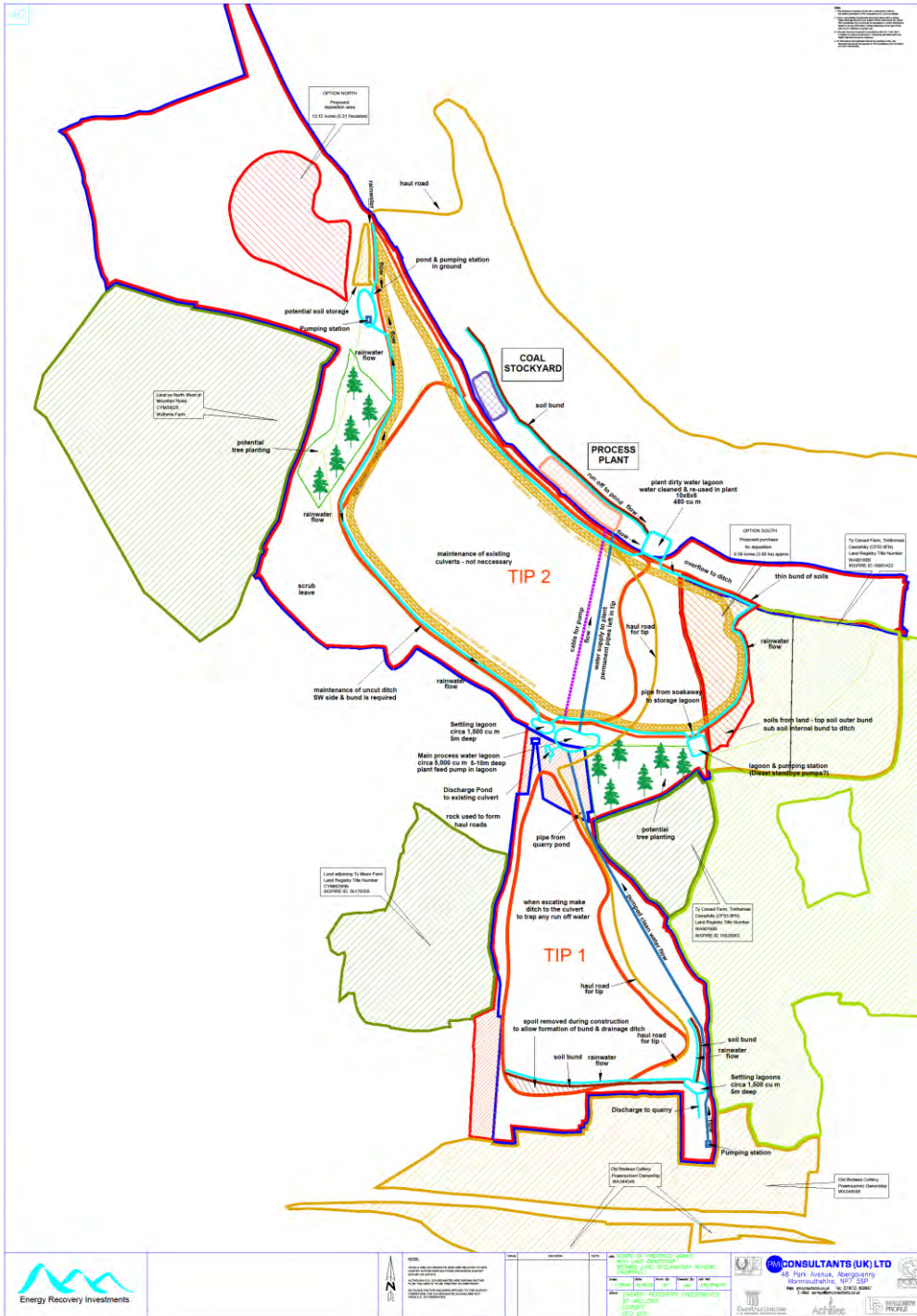
The general arrangement for the works including the two tip sites and the haul road is illustrated in Figures 1-1 and 1-2 below. The development will operate over a period of approximately six years and will be conducted in the following stages:

- Construction of the following: access road, clean water pond, sit bunding and water drainage channels, site water collection and treatment ponds, process plant, portable buildings for workers;
- Excavation;
- Deposition;
- Reclamation;
- Decommissioning; and
- Aftercare (5-year period).

The general arrangement for the works including the two tip sites and the proposed haul road (which follows the existing track) is illustrated in Figures 1-1 and 1-2 below.

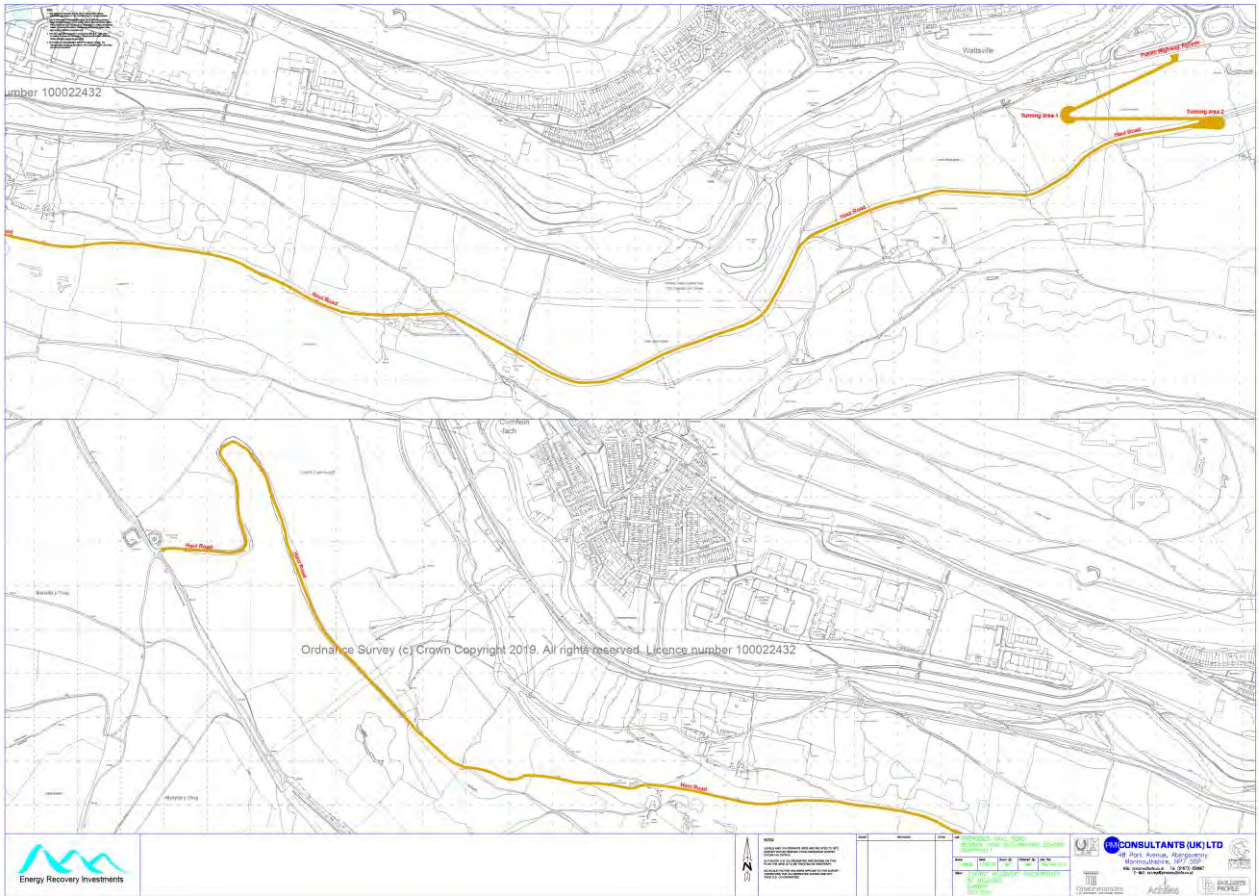
The location of the proposed works is illustrated in Figure 1-3 and hereafter referred to as ‘the Scheme’. The Scheme has been further divided into the ‘Haul Road’ and the ‘Main Site’, shown in Figure 1-3. The southerly tip site (Tip 1) will be referred to as the ‘Lower’ tip, whilst the northern tip site (Tip 2) will be referred to as the ‘Upper’ tip.

**Figure 1-1 - Constructional and Operational Plan – Main Site**





**Figure 1-2 – Proposed Haul Road**



**Figure 1-3 - Scheme location. Red line indicates approximate boundary of works area. Red line = Haul Road, red polygon = Main Site.**





## **ECOLOGICAL BACKGROUND**

Based on aerial imagery and habitat type data provided by SEWBReC, land use within the Scheme area was predominantly spoil across the two tip sites, whilst the proposed haul road was generally located within woodland habitats. Land use surrounding the tips consisted mainly of agricultural land with pockets of woodland and scrub, and the urban development of Bedwas town was situated to the south. To the north-west of the Scheme lay Mynydd y Grug SINC, and to the north-east, Cwmfelinfach village, separated by a large strip of woodland and the Sirhowy river. The river ran roughly parallel to the haul road to the north. The Scheme partially overlapped both statutory and non-statutory designated sites.

## 2 METHODOLOGY

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### 2.1 DESKTOP STUDY

A request to the South East Wales Biological Records Centre (SEWBRc) was made for information on any ecologically designated sites, habitats and protected species or species of conservation concern within a 1km (5km for bats) radius of Bedwas Tips Reclamation Scheme (Approximate Central Grid Reference: ST 17668 90526) in the last 10 years (SEWBRc, 2022). This included a request for data for priority and protected species listed under Section 7 of the Environment (Wales) Act 2016. Priority and protected invertebrate species and those of Local Concern were included in these searches.

Where third party data is referred to, for example from online searches and Biodiversity Record Centre data, WSP cannot be held responsible for the accuracy of the information.

### 2.2 HABITAT ASSESSMENT & FIELD SURVEY

Habitats within and surrounding the Scheme were assessed using a combination of aerial photographs and the findings of the Preliminary Ecological Appraisal (PEA) survey carried out by WSP (WSP, 2023).

The survey area provides a mosaic of habitats likely to support a rich diversity of invertebrates. There was good ecological variation and connectivity between these habitats across much of the Scheme area and a substantial number of species would likely be recorded with any degree of dedicated effort.

For this report, however, the scope of the surveys undertaken were concentrated on, but not limited to, key protected and Priority species and species of Local Concern identified via SEWBRc data searches. See Appendix A for full list and legislation/conservation status.

The following resources were consulted for information on the most notable habitats and larval food plants associated with these species:

- A Field Guide to the Moths of Great Britain and Ireland (Waring *et al.*, 2017)
- Collins Butterfly Guide (Tolman & Lewington, 2009)
- Britain's Dragonflies (Smallshire & Swash, 2nd ed., 2010)
- Field guide to the caterpillars of Great Britain and Ireland. Bloomsbury Publishing Plc. (Sterling, 2020)
- Orthoptera & Allied insects. Available at: <https://orthoptera.org.uk/> {Accessed: February 6, 2023}.

Survey effort was centred around habitats where target species were considered most likely to be found and habitats considered mostly likely to be impacted by the Scheme (see Table 2-1).



**Table 2-1 – Protected/Priority and Local Concern ‘target’ invertebrate species within 1km.**

| Common name                                  | Scientific name                 | Legislation/ Conservation Status | Preferred habitats (Relevant to site)   |
|--|---------------------------------|----------------------------------|---|
| <b>Protected/Priority species within 1km</b> |                                 |                                  |   |
| Autumnal rustic                              | <i>Eugnorisma glareosa</i>      | S7                               | Heathland, moorland, rough grassland, open woodland   |
| Brindled beauty                              | <i>Lycia hirtaria</i>           | S7                               | Broadleaved woodland, scrub, hedgerows, parks, and gardens  |
| Broom moth                                   | <i>Ceramica pisi</i>            | S7                               | Heathland and moorland. Less frequently, woodland and marshland.  |
| Buff ermine                                  | <i>Spilosoma lutea</i>          | S7                               | Most habitats including gardens, hedgerows, parks, and woodland   |
| Cinnabar                                     | <i>Tyria jacobaeae</i>          | S7                               | Well drained, rabbit-grazed grassland, including heathland, also open habitats such as gardens and woodland rides                       |
| Dark-barred twin-spot carpet                 | <i>Xanthorhoe ferrugata</i>     | S7                               | Gardens, woodland, hedgerows, moorland  |
| Dingy skipper                                | <i>Erynnis tages</i>            | S7, RDB1 (UK) - VU, LI(SEWBRcC)  | Damp or dry grassy, flowery places  |
| Dot moth                                     | <i>Melanchra persicariae</i>    | S7                               | Gardens, hedgerows, open and wooded habitats  |
| Feathered gothic                             | <i>Tholera decimalis</i>        | S7                               | Rough grassland, woodland rides and edges, parkland, some gardens   |
| Flounced chestnut                            | <i>Anchoscelis helvola</i>      | S7                               | Wide range of grassy places, woodland rides   |
| Forester                                     | <i>Adscita statices</i>         | S7                               | Open habitats including damp grassland, acid heathland, woodland rides, and clearings   |
| Knot grass                                   | <i>Acronicta rumicis</i>        | S7                               | Most open habitats including gardens, grassland, heathland, and some woodland   |
| Sallow                                       | <i>Cirrhia icteritia</i>        | S7                               | Broadleaved woodland, marshes, heathland  |
| Shaded broad-bar                             | <i>Scotopteryx chenopodiata</i> | S7                               | Wide range of open grassy places, including hedgerows, acid heathland, woodland rides, rough roadside verges                            |
| Small heath                                  | <i>Coenonympha pamphilus</i>    | S7, RDB1 (UK) - NT               | Grassy places of diverse character  |
| Small phoenix                                | <i>Ecliptopera silaceata</i>    | S7                               | Woodland rides & glades, hedgerows, roadside verges, heathland, derelict urban sites  |
| White ermine                                 | <i>Spilosoma lubricipeda</i>    | S7                               | Most rural and urban habitats, including gardens, hedgerows, wet & dry grassland, heathland, woodland                                   |
| <b>Species of Local Concern within 1km</b>   |                                 |                                  |   |
| Azure damselfly                              | <i>Coenagrion puella</i>        | LBAP[CLY]                        | Wide range of standing waters, including acidic or eutrophic but preferring smaller, sheltered sites. Also garden ponds, small ditches. |

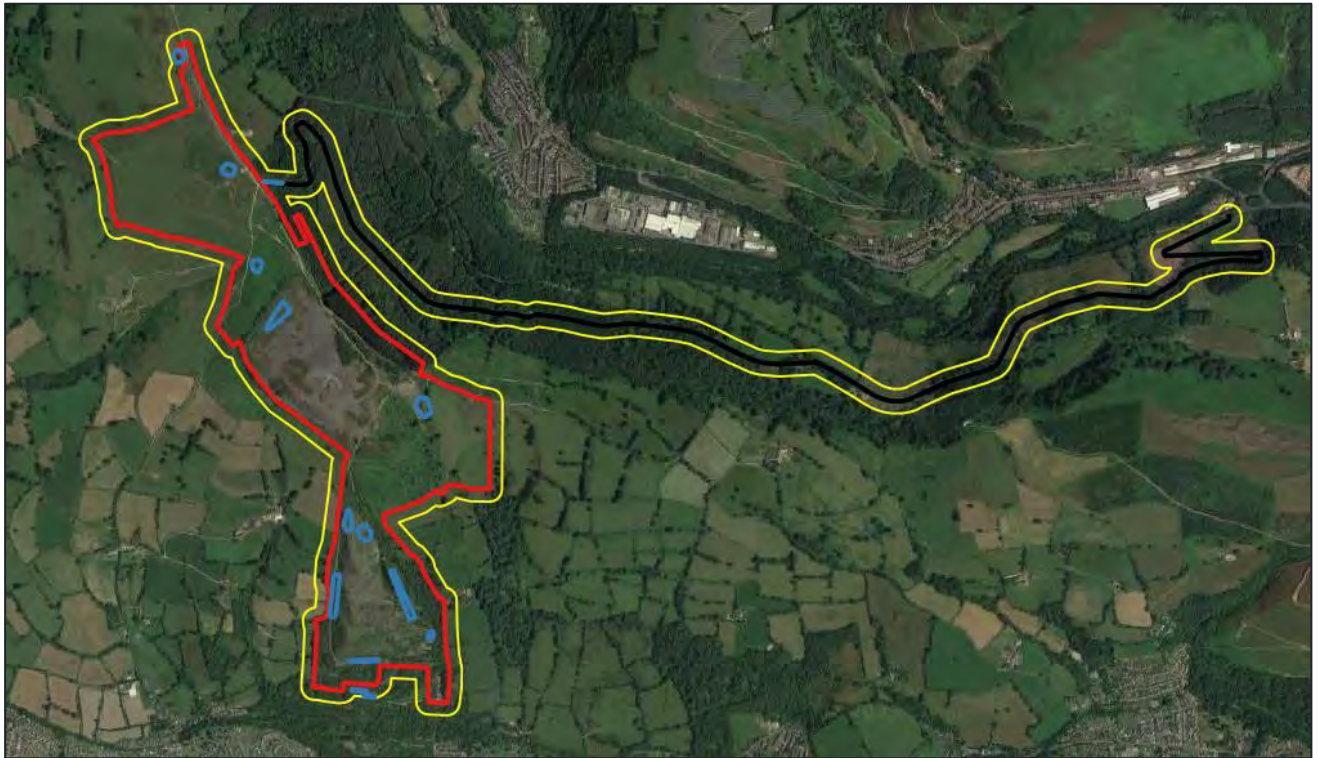
| Common name              | Scientific name                 | Legislation/ Conservation Status | Preferred habitats (Relevant to site)  |
|--------------------------|---------------------------------|----------------------------------|--|
| Black-tailed skimmer     | <i>Orthetrum cancellatum</i>    | LBAP[CLY], LI[SEWBRcC]           | Lowland lakes, ponds, large drains, slow-flowing rivers.   |
| Blue-tailed damselfly    | <i>Ischnura elegans</i>         | LBAP[CLY]                        | Wide range of lowland habitats though less common in acidic waters and avoids fast-flowing waters                                    |
| Common blue damselfly    | <i>Enallagma cyathigerum</i>    | LBAP[CLY]                        | Wide range of still and flowing waters, avoids small ponds   |
| Common darter            | <i>Sympetrum striolatum</i>     | RD1(UK)DD, LBAP[CLY]             | Wide range of habitats including ponds, lakes, ditches, shallow waters   |
| Emerald damselfly        | <i>Lestes sponsa</i>            | LBAP[CLY], LI[SEWBRcC]           | Small, shallow standing water with rich vegetation, such as grass, rushes, and sedges  |
| Emperor dragonfly        | <i>Anax imperator</i>           | LBAP[CLY]                        | Well-vegetated ponds, lakes, large ditches, canals, and slow-flowing rivers  |
| Golden-ringed dragonfly  | <i>Cordulegaster boltonii</i>   | LBAP[CLY], LI[SEWBRcC]           | Acidic running waters, typically in heathland or woodland  |
| Keeled skimmer           | <i>Orthetrum coerulescens</i>   | LBAP[CLY], LI[SEWBRcC]           | Closely associated with acidic wet heathland sites   |
| Large red damselfly      | <i>Pyrrhosoma nymphula</i>      | LBAP[CLY]                        | Most wetland habitats but avoids fast-flowing waters and prefers sheltered waters with abundant aquatic plants                       |
| Little thorn             | <i>Cepphis advenaria</i>        | LBAP[CLY]                        | Sunny, open woodland & low vegetation on verges of rides, sometimes long-established scrub or lighter, heathy soils.                 |
| Satin lutestring         | <i>Tethella fluctuosa</i>       | LBAP[CLY]                        | Long-established , mature broadleaved woodland   |
| Silver-washed fritillary | <i>Argynnis paphia</i>          | LBAP[CDF, NEW], LI[SEWBRcC]      | Sunny, woodland clearings with bushy margins, usually containing bramble ( <i>Rubus fruticosus</i> agg.) or other nectar-rich plants |
| Southern hawk            | <i>Aeshna cyanea</i>            | LBAP[CLY]                        | Well-vegetated neutral or alkaline standing water, sometimes shaded by trees   |
| Speckled bush-cricket    | <i>Leptophyes punctatissima</i> | LI[SEWBRcC]                      | Open woodland, scrub, gardens and hedgerows  |

The bulk of the survey effort was concentrated on the invertebrate orders Lepidoptera (moths and butterflies) and Odonata (dragonflies and damselflies) which included most of the target species identified in the SEWBRcC data set. These being well-studied groups that have a good number of habitat quality indicator species. Miscellaneous records of other orders included:

- Orthoptera (crickets and grasshoppers);
- Hemiptera (true bugs);
- Coleoptera (beetles);
- Hymenoptera (bees and wasps); and
- Spider (Araneae).

Patches of habitat chosen for searches were based on their likelihood to support target species. Due to the extensive size of the Scheme and limited time allocated for the survey no attempt was made to cover habitats alongside the Haul Road. See Figure 2-1 for approximate locations of searches within the Scheme.

**Figure 2-1 – Scheme area (red) plus 50m survey boundary (yellow) and approximate locations for invertebrate searches (blue). Haul Road (black) not surveyed.**



Direct observations were the primary method for recording, as many of the target species were diurnal and easily observed and recognised in the field. Other ad hoc sampling techniques employed included sweep-netting, tree-beating, and hand-searching.

Due to an abundance of willow particularly at the southern end of the Scheme a pheromone lure was used to test for the presence of red-tipped clearwing (*Synanthedon formicaeformis*) during July 2023. An under-recorded Nationally Scarce species, red-tipped clearwing larvae are known to feed on various willow species.

Four survey visits on 07 and 08 June 2023, and 25 and 26 July 2023 covered habitats at both the Upper and Lower Tip sites. Surveys were carried out in appropriate weather conditions, avoiding cold weather, days with high winds, heavy rain, or poor visibility, guarding against the possibility of under recording due to invertebrate activity being suppressed.

Dates, times, and weather conditions, for each survey are provided in Appendix B.

Opportunistic observations made during other ecological surveys within the Scheme were noted and incorporated in the analysis.

The rarity status of well-studied invertebrates is based on the number 10km squares they have been recorded in. Red Data Book species are our rarest species and are found in less than 16 10km squares in the UK. Nationally Scarce species are known to occur in 100 or fewer 10km squares,





which is sometimes split into Notable A (Na) and Notable B(Nb) (Na species occur within 16 - 30 10km squares and Nb species between 31 – 100 10km squares). Another category exists for species recorded between 100 – 300 10km squares, these being considered as ‘Local’ at a national level. These generally have either geographically restricted distributions or have specific habitat requirements.

## **2.3 SURVEY CONSTRAINTS**

Any ecological survey can only identify what was present on site at the time it was conducted and habitat usage by species can change over time. The length of time that the survey data remains valid will depend on a case-by-case basis, but it is considered that if the development does not begin within 2 years of the date of this report an update may be required.

### 3 PREVIOUS REPORTS/DESKTOP STUDY RESULTS

#### 3.1 DESIGNATED SITES

##### STATUTORY SITES

Two national statutory designated sites were located within 1km of the Scheme, both of which were Local Nature Reserves (LNR). See Table 3-1.

Specific reference to invertebrates within the citation or comment by the author of this report regarding invertebrates is highlighted in **bold**.

**Table 3-1 - Statutory designated sites within 1km of the Scheme.**

| Site name       | Designation | Description  | Approximate distance and direction from Scheme |
|-----------------|-------------|--|--|
| Graig Goch      | LNR         | Ancient oak and beech woodland set in Sirhowy Valley Country Park. Species of <b>butterflies, moths</b> , have been recorded.  | Haul Road passes directly through site         |
| Flatwood Meadow | LNR         | Two old hay meadows on banks of Sirhowy River – some of few remaining examples of species-rich grasslands in Sirhowy Valley. Diverse community of wildflowers <b>supporting butterflies and moths such as the small pearl-bordered fritillary (<i>Boloria selene</i>) and marsh pug (<i>Eupithecia pygmaeata</i>).</b> | 170 m north of Haul Road                       |

##### NON-STATUTORY SITES

Eighteen non-statutory designates sites were located within 1km of the Scheme, all of which were Sites of Importance for Nature Conservation (SINCs). Those most relevant to the Scheme are detailed in Table 3-2.

Specific reference to invertebrates within the citation or comment by the author of this report regarding invertebrates is highlighted in **bold**.

**Table 3-2 – Non-statutory designated sites within 1km of the Scheme.**

| Site name                               | Designation | Description   | Approximate distance and direction from Scheme  |
|---|-------------|---|---|
| Mynydd y Grug, West of Cwmfelinfach     | SINC        | Area of sheep-grazed common covered by bracken ( <i>Pteridium aquilinum</i> ), acid grassland and semi-improved acid grassland. Also includes two small marshy areas and three ponds. Pond habitats are likely to support <b>dragonflies</b> .  | Scheme area (Upper tip site and large area to north-west) sits partially within SINC. |
| Mynydd Bach Slopes, East of Llanbradach | SINC        | A west-facing valley side supporting a mix of broadleaved woodland, marshy grassland, semi-improved acid grassland, bracken and scrub. Includes ancient woodland and some wet woodland. <b>The site is likely to support good a high diversity of invertebrates, including potentially small pearl-bordered fritillary (<i>Boloria selene</i>) butterfly.</b> | West of northern area of Main Site (immediately west of Mynydd y Grug SINC)           |

| Site name                                  | Designation | Description  | Approximate distance and direction from Scheme         |
|--|-------------|--|--|
| Twyn yr Oerfel, South of Cwmfelinfach      | SINC        | North-facing slope making up part of Mynydd y Grug Common. Mainly comprises bracken and acid grassland with scattered scrub. Also includes flush and pond with associated vegetation. Pond, acid grassland and bracken are likely to support amphibians, <b>dragonflies</b> , and reptiles.  | Northern area of Main Site sits partially within SINC. |
| Berth Goch Wood, North of Trethomas        | SINC        | Ancient woodland with canopy of mature oak. Heavily sheep and cattle grazed. <b>Holly blue (<i>Celastrina argiolus</i>), small tortoiseshell (<i>Aglais urticae</i>), and speckled wood (<i>Pararge aegeria</i>) butterflies were noted in the SINC species list (May 2007).</b>   | 45m east of Main Site                                  |
| River Sirhowy                              | SINC        | Comprises full length of River Sirhowy and adjacent semi-natural habitats. <b>Species list for SINC included on CCBC citation includes cinnabar (<i>Tyria jacobaeae</i>), dingy skipper (<i>Erynnis tages</i>), high brown fritillary (<i>Fabriciana adippe</i>), marsh fritillary (<i>Euphydryas aurinia</i>), and silver-washed fritillary (<i>Argynnis paphia</i>).</b> | 70m north of Haul Road                                 |
| Graig y Prisiad Woodlands, Ynysddu         | SINC        | Comprises mainly replanted, former ancient woodland. Includes grassland with <b>high density of anthills.</b>  | 100m north of Haul Road                                |
| Mynydd Machen, West of RIsca               | SINC        | Area of sheep grazed common, covered mainly by bracken, acid grassland and heath. <b>No specific mention for invertebrates</b> although habitats are likely to support a range of species.   | 110m south of Haul Road                                |
| Sirhowy Country Park Meadows, Cwmfelinfach | SINC        | Land adjacent to River Sirhowy edge, supporting grassland and scrub habitats. Also contains two ponds. <b>Habitats on site are likely to support a high diversity of invertebrates.</b>  | 220m north of Haul Road                                |

## 3.2 HABITATS

The Phase 1 habitat survey (WSP, 2023) included a range of habitats suitable to support a wide diversity of invertebrate species in terms of foraging, sheltering, and breeding. Main habitats included extensive areas of colliery spoil; marshy grassland; continuous bracken; dense scrub; acid heathland, dry dwarf shrub heath (acid), and lichen/bryophyte heath mosaic; plantation, broadleaved and felled woodland; as well as ponds. For habitat examples see Appendix D (D-1.1 to D-1.6) and for further details relating to habitats within the Scheme refer to Bedwas Tips Reclamation: Preliminary Ecological Appraisal (PEA) Report (WSP, 2023).

## 3.3 PRIORITY SPECIES

Appendix A lists Priority species under the Environment (Wales) Act 2016 and rare and/or nationally scarce invertebrates including Red Data Book species, Nationally Scarce (Notable A (Na) and Notable B (Nb)). Species of Local Conservation Concern included Local Biodiversity Action Plan (LBAP) species and Locally Important Species (as identified by local specialists) in the SEWBRcC recording area (LI (SEWBRcC)).



A summary of the records is detailed as follows:

## **PRIORITY INVERTEBRATE SPECIES**

A total of 66 records for 17 Priority moth and butterfly invertebrate species were returned from 1km SEWBReC data searches. All were Environment (Wales) Act 2016 Section 7 (S7) listed species of 'Principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales.'

Moth species comprised autumnal rustic (*Eugnorisma glareosa*), brindled beauty (*Lycia hirtaria*), broom moth (*Ceramica pisi*), buff ermine (*Spilosoma lutea*), cinnabar (*Tyria jacobaeae*), dark-barred twin-spot carpet (*Xanthorhoe ferrugata*), dot moth (*Melanchra persicariae*), feathered gothic (*Tholera decimalis*), flounced chestnut (*Anchoscelis helvola*), forester (*Adscita statures*), knot grass (*Acronicta rumicis*), sallow (*Cirrhia icteritia*), shaded broad-bar (*Scotopteryx chenopodiata*), small phoenix (*Ecliptopera silaceata*), and white ermine (*Spilosoma lubricipeda*).

Red Data Book UK listed butterfly species included dingy skipper (*Erynnis tages*) classed as Vulnerable (VU) and small heath (*Coenonympha pamphilus*) classed as Near Threatened (NT).

## **SPECIES OF LOCAL CONCERN**

A total of 28 records for 16 invertebrate species of Local Concern were returned within 1km comprising 12 dragonfly and damselfly species, two moth species, one butterfly species, and one cricket.

Thirteen species were CCBC Local Biodiversity Action Plan (LBAP) species and six were Locally Important (LI) species for SEWBReC.

Dragonfly and damselfly species of Local Concern comprised azure damselfly (*Coenagrion puella*), black-tailed skimmer (*Orthetrum cancellatum*), blue-tailed damselfly (*Ischnura elegans*), common blue damselfly (*Enallagma cyathigerum*), common darter (*Sympetrum striolatum*), emerald damselfly (*Lestes sponsa*), emperor dragonfly (*Anax imperator*), golden-ringed dragonfly (*Cordulegaster boltonii*), keeled skimmer (*Orthetrum coerulescens*), large red damselfly (*Pyrrhosoma nymphula*), and southern hawker (*Aeshna cyanea*).

Moth, butterfly, and cricket species of Local Concern comprised little thorn (*Cepphis advenaria*) and satin lutestring (*Tetheella fluctuosa*), silver-washed fritillary (*Argynnis paphia*), and speckled bush-cricket (*Leptophyes punctatissima*) respectively.

## 4 RESULTS

### 4.1 FIELD SURVEY

A total of 199 terrestrial invertebrate species were recorded during diurnal surveys within the Scheme. Most were identified to species level (167) while the remaining records were identified to genus or family group. See Table 4-1.

In addition, incidental records for four aquatic invertebrate species were also noted.

Representatives from a wide variety of invertebrate groups were recorded.

A full list of invertebrates recorded during surveys is provided in Appendix C and supporting photographs for the report are provided in Appendix D. Appendix E lists larval food plants associated with the key protected and priority and Local Concern moth and butterfly species identified via SEWBRc data searches.

**Table 4-1 – Total number of species per order recorded within the Scheme.**

| Order                                  | Number of species |
|--|-------------------|
| Araneae (spiders)                      | 15                |
| Coleoptera (beetles)                   | 25                |
| Dermaptera (earwigs)                   | 1                 |
| Diptera (flies)                        | 39                |
| Hemiptera (true bugs)                  | 23                |
| Hymenoptera (bees, wasps, and ants)    | 26                |
| Isopoda (woodlice)                     | 1                 |
| Julida (millipedes)                    | 1                 |
| Lepidoptera (moths and butterflies)    | 42                |
| Lithobiomorpha (centipedes)            | 1                 |
| Mecoptera (scorpionflies)              | 1                 |
| Neuroptera (lacewings and antlions)    | 1                 |
| Odonata (dragonflies)                  | 8                 |
| Opiliones (harvestmen)                 | 1                 |
| Orthoptera (grasshoppers and crickets) | 7                 |
| Stylommatophora (slugs and snails)     | 5                 |
| Symphyleona (springtails)              | 1                 |
| Trombidiformes (mites)                 | 1                 |
| <b>Total number of species</b>         | 199               |

Of the 199 invertebrate species identified within the Scheme, at least 10 were considered Priority species i.e., species considered to be rare or scarce, localised, and/or S7 Environment (Wales) Act 2016 listed species. See Table 4-2 and supporting photographs in Appendix D (D-1.7 to D-1.18).

**Table 4-2 – Protected/Priority species recorded within the Scheme.**

| Common name          | Scientific name                   | Family       | Order       | Conservation status       |
|----------------------|-----------------------------------|--------------|-------------|---------------------------|
| Bee chafer           | <i>Trichius fasciatus</i>         | Scarabaeidae | Coleoptera  | Local                     |
| Western bee-fly      | <i>Bombylius canescens</i>        | Bombyliidae  | Diptera     | Nationally Scarce         |
| Little thorn         | <i>Cepphis advenaria</i>          | Ennominae    | Lepidoptera | Nationally Scarce         |
| Cinnabar             | <i>Tyria jacobaeae</i>            | Erebidae     | Lepidoptera | S7                        |
| Red-necked footman   | <i>Atolmis rubricollis</i>        | Erebidae     | Lepidoptera | Local                     |
| Shaded broad-bar     | <i>Scotopteryx chenopodiata</i>   | Geometridae  | Lepidoptera | S7                        |
| Dingy skipper        | <i>Erynnis tages</i>              | Hesperiidae  | Lepidoptera | S7, RDB1 (UK) – VU, Local |
| Small heath          | <i>Coenonympha pamphilus</i>      | Nymphalidae  | Lepidoptera | S7, RDB1 (UK) - NT        |
| Grayling             | <i>Hipparchia semele</i>          | Nymphalidae  | Lepidoptera | S7, RDB1 (UK) – VU, Local |
| Red-tipped clearwing | <i>Synanthedon formicaeformis</i> | Sesiidae     | Lepidoptera | Nationally Scarce         |

In addition to species listed in Table 4-2 at least a further six species were considered of Local Concern as identified via SEWBRc data searches. See Table 4-3 and Table 2-1.

**Table 4-3 – Species recorded within the Scheme and identified as of Local Concern via SEWBRc data searches.**

| Common name             | Scientific name                 | Family           | Order      | Conservation status   |
|-------------------------|---------------------------------|------------------|------------|-----------------------|
| Azure damselfly         | <i>Coenagrion puella</i>        | Coenagrionidae   | Odonata    | LBAP[CLY]             |
| Common darter           | <i>Sympetrum striolatum</i>     | Libellulidae     | Odonata    | LBAP[CLY]             |
| Golden-ringed dragonfly | <i>Cordulegaster boltonii</i>   | Cordulegastridae | Odonata    | LBAP[CLY], LI[SEWBRc] |
| Large red damselfly     | <i>Pyrrhosoma nymphula</i>      | Coenagrionidae   | Odonata    | LBAP[CLY]             |
| Southern hawker         | <i>Aeshna cyanea</i>            | Aeshnidae        | Odonata    | LBAP[CLY]             |
| Speckled bush-cricket   | <i>Leptophyes punctatissima</i> | Tettigoniidae    | Orthoptera | LI[SEWBRc]            |

\*CLY = Caerphilly



## 5 DISCUSSION AND CONCLUSIONS

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The focus of recording effort on diurnal species was largely confined to areas of representative habitat across the Scheme and habitats considered most likely to support target species as identified via SEWBRc data. Habitat searches therefore included patches of marshy grassland; dense scrub; broadleaved woodland; bracken; acid grassland, heathland, and lichen/bryophyte mosaic; as well as pond margins.

A total of 17 different Priority species as well as 16 species of Local Concern were returned via SEWBRc data searches within 1km of the Scheme.

During the field survey 10 Priority species were identified including four of the target species, namely small heath, dingy skipper, cinnabar, and shaded broad-bar. Little thorn, listed as of Local Concern via SEWBRc searches, was also located is listed as Nationally Scarce (Brock, 2021). As such this too was considered a Priority species. Additionally, all six of the species identified as of Local Concern (excluding little thorn) were target species for the survey.

Priority species outside of the target species located during the survey included those of 'Local' distribution, namely red-necked footman (moth) and bee chafer (beetle); the S7 and Red Data Book (UK) vulnerable species, grayling (butterfly); and the Nationally Scarce, red-tipped clearwing (moth) and Western bee-fly.

Several species of Priority concern recorded during the field survey rely on a mosaic of habitats and plant species currently found occurring within the Scheme. Grayling, dingy skipper, and Western bee-fly all require areas of bare ground, in addition to varying levels of vegetation. Both grayling and dingy skipper (as well as other more commonly occurring butterfly species) require bare ground for basking, while *Lassioglossum* and *Halictus* host species on which the parasitic Western bee-fly depends, often require areas of bare ground for nesting.

A mix of both dry and wet habitats is also important for a variety of Priority and Local Concern species. The larvae of small heath and grayling are reliant on a mix of fine leaved dry grassland species such as fescues (*Festuca* spp.) and bents (*Agrostis* spp.), while red-tipped clearwing larvae feed on willow species associated with damp or marshy ground.

It is therefore considered essential that a mosaic of habitats, including areas of well vegetated, sparsely vegetated, and bare ground, supporting a diversity of plant species should remain for species of Priority and Local concern to continue to utilise the area of the Scheme.

Although the limited extent of survey effort under-represents the invertebrate assemblages likely to be present in habitats across the Scheme the data search results indicate that no legally protected invertebrate species were considered likely to be present.

There were however five S7 Environment (Wales) Act 2016 Priority species recorded during the survey and public bodies have an obligation to have regard for these species when carrying out their functions. Maintaining and enhancing the diversity of habitats within the Scheme should therefore be a key aim of the mitigation strategy to ensure invertebrate diversity and productivity is maintained.

## 6 RECOMMENDATIONS AND ENHANCEMENTS

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### 6.1 POLLUTION PREVENTION MEASURES

Where ponds are retained (or created) and to safeguard dragonfly and damselfly species recorded within the Scheme identified as of Local Concern via SEWBReC data searches, standard best practice and pollution control measures are recommended in accordance with relevant guidance (e.g., CIRIA, 2001 and Environment Agency (2018). Guidelines for Pollution Prevention (GPP), particularly GPP 5 Works and maintenance in or near water, outlined in NetRegs (NetRegs, 2018) to ensure that watercourses within the Scheme e.g., ditches and ponds are not directly or indirectly adversely affected by silt, dust, uncontrolled surface water run-off, inappropriate storage of materials and/or inappropriate refuelling of machinery. These measures should be detailed in a Risk Management Plan/ Construction Environmental Management Plan (CEMP).

- All materials (especially if hazardous or toxic) should be stored securely at least 7 m away from the watercourse.
- All static machinery should be placed on drip-trays or oil absorbent nappies. Trays should be emptied regularly to ensure that they contain any spills.
- Refuelling of machinery should not be carried out on site.
- Location of site compounds should be discussed with an ecologist prior to commencement of the works.

### 6.2 RESEEDING/PLANTING OF GRASSLAND

If reseeded/planting of grassland habitat is required a diverse mix of grassland/plant species is recommended to support a rich variety of invertebrate species including those of Priority and Local concern.

### 6.3 ENHANCEMENT

Planning Policy Wales 11 (Welsh Government, 2021) advocates the enhancement of biodiversity in relation to sites. The following measures are recommended to comply with this policy:

#### **Creation of additional water bodies**

Creation of wildlife ponds to create additional habitat for damselfly and dragonfly species identified as of Local Concern via SEWBReC data searches.

Ponds would also be beneficial for other species such as amphibians, grass snake (*Natrix helvetica helvetica*), bats, and birds.

#### **Cattle/sheep proof fencing**

Fencing off existing ponds e.g., the pond within Mynydd y Grug SINC at the northern extent of Scheme (see Bedwas Tips Reclamation PEA Report (WSP, 2023) for further details) to prevent cattle poaching the ground and allow more species-rich marginal vegetation to develop. It would also enhance the water quality within the pond and improve habitat conditions for aquatic life stages of invertebrates such as damselflies and dragonflies.



### **Supplementary seeding and plug planting**

Set aside designated strips/patches of native, locally sourced wildflower seeds or plug plants of species representative of the area to include common bird's-foot-trefoil (*Lotus corniculatus*) to increase habitat potential for dingy skipper, a S7 and RDB1 (UK) – VU species.

### **Brash piles**

Brash piles created from vegetation removal would provide additional habitat for invertebrate species.



## 7 REFERENCES

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- Brock, P.D. (2021) Britain's Insects; A field guide to the insects of Great Britain and Ireland. Hampshire: WILDGuides
- Environment (Wales) Act (2016).
- Google Earth (2023)
- NetRegs (2018) Best Practice Guidelines (GPP) -Works and maintenance in or near water: GPP5 Available at <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/> Guidance for Pollution Prevention (GPPs) – Full list: <https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/> [Accessed October 2023]
- Orthoptera & Allied insects. Available at: <https://orthoptera.org.uk/> {Accessed: February 6, 2023}.
- Smallshire, D. and Swash, A. (2010) Britain's Dragonflies: A field guide to the damselflies and dragonflies of Britain and Ireland (2nd edn). Hampshire: WILDGuides
- South East Wales Biodiversity Records Centre (SEWBRc) (2023). Biodiversity Information Search – Bedwas Tips [Ref: 7000956].
- Sterling, P. (2020) Field guide to the Caterpillars of Great Britain and Ireland. London: Bloomsbury Publishing Plc.
- Sterling, P. and Parsons, M. (2012) Field Guide to the Micro Moths of Great Britain and Ireland. Dorset: British Wildlife Publishing Ltd.
- Tolman, T. and Lewington, R. (2009) Collins butterfly guide. London: Collins.
- Waring, P., Townsend, M. and Lewington, R. (2017) Field guide to the moths of Great Britain and Ireland. London: Bloomsbury Publishing PLC.
- Welsh Government (2021). Planning Policy Wales. Edition 11. [Online]. [Accessed October 2023]. Available at: <https://www.gov.wales/planning-policy-wales>
- WSP (2023) Bedwas Tips Reclamation: Preliminary Ecological Appraisal (PEA) Report

# Appendix A

**DESKTOP STUDY DATA (SEWBREC)**



**Table A-1 – Priority invertebrate species within 1km of the Scheme.**

| <b>Priority invertebrate species within 1 km</b> |                                 |  |                          |                           |
|--|---------------------------------|--|--------------------------|---------------------------|
| <b>Common name</b>                               | <b>Scientific name</b>          | <b>Legislation/Conservation Status</b> | <b>Number of Records</b> | <b>Most Recent Record</b> |
| Autumnal rustic                                  | <i>Eugnorisma glareosa</i>      | S7                                     | 2                        | September 2013            |
| Brindled beauty                                  | <i>Lycia hirtaria</i>           | S7                                     | 1                        | May 2021                  |
| Broom moth                                       | <i>Ceramica pisi</i>            | S7                                     | 1                        | July 2022                 |
| Buff ermine                                      | <i>Spilosoma lutea</i>          | S7                                     | 2                        | July 2013                 |
| Cinnabar   | <i>Tyria jacobaeae</i>          | S7                                     | 5                        | June 2021                 |
| Dark-barred twin-spot carpet                     | <i>Xanthorhoe ferrugata</i>     | S7                                     | 2                        | August 2013               |
| Dingy skipper                                    | <i>Erynnis tages</i>            | S7, RDB1 (UK) - VU, LI(SEWBRcC)        | 7                        | May 2020                  |
| Dot moth   | <i>Melanchra persicariae</i>    | S7                                     | 3                        | July 2022                 |
| Feathered gothic                                 | <i>Tholera decimalis</i>        | S7                                     | 3                        | August 2013               |
| Flounced chestnut                                | <i>Anchoscelis helvola</i>      | S7                                     | 3                        | September 2013            |
| Forester   | <i>Adscita statices</i>         | S7, LI(BIS)                            | 9                        | June 2014                 |
| Knot grass                                       | <i>Acronicta rumicis</i>        | S7                                     | 2                        | July 2022                 |
| Sallow   | <i>Cirrhia icteritia</i>        | S7                                     | 3                        | September 2013            |
| Shaded broad-bar                                 | <i>Scotopteryx chenopodiata</i> | S7                                     | 2                        | July 2016                 |
| Small heath                                      | <i>Coenonympha pamphilus</i>    | S7, RDB1 (UK) - NT                     | 10                       | August 2020               |
| Small phoenix                                    | <i>Ecliptopera silaceata</i>    | S7                                     | 9                        | July 2022                 |
| White ermine                                     | <i>Spilosoma lubricipeda</i>    | S7                                     | 2                        | June 2022                 |



**Table A-2 – Invertebrate species of Local Concern within 1km of the Scheme**

| Invertebrate species of Local Concern within 1km |                                 |                                 |                   |                    |
|--|---------------------------------|---------------------------------|-------------------|--------------------|
| Common name                                      | Scientific name                 | Legislation/Conservation Status | Number of Records | Most Recent Record |
| Azure damselfly                                  | <i>Coenagrion puella</i>        | LBAP[CLY]                       | 2                 | July 2022          |
| Beautiful demoiselle                             | <i>Calopteryx virgo</i>         | LBAP[CLY], LI[SEWBRcC]          | 1                 | May 2020           |
| Black-tailed skimmer                             | <i>Orthetrum cancellatum</i>    | LBAP[CLY], LI[SEWBRcC]          | 1                 | June 2018          |
| Blue-tailed damselfly                            | <i>Ischnura elegans</i>         | LBAP[CLY]                       | 1                 | July 2022          |
| Common blue damselfly                            | <i>Enallagma cyathigerum</i>    | LBAP[CLY]                       | 3                 | August 2022        |
| Common darter                                    | <i>Sympetrum striolatum</i>     | RD1(UK)DD, LBAP[CLY]            | 2                 | August 2022        |
| Emerald damselfly                                | <i>Lestes sponsa</i>            | LBAP[CLY], LI[SEWBRcC]          | 1                 | July 2022          |
| Emperor dragonfly                                | <i>Anax imperator</i>           | LBAP[CLY]                       | 2                 | July 2022          |
| Golden-ringed dragonfly                          | <i>Cordulegaster boltonii</i>   | LBAP[CLY], LI[SEWBRcC]          | 5                 | July 2022          |
| Keeled skimmer                                   | <i>Orthetrum coerulescens</i>   | LBAP[CLY], LI[SEWBRcC]          | 1                 | June 2022          |
| Large red damselfly                              | <i>Pyrrosoma nymphula</i>       | LBAP[CLY]                       | 1                 | July 2022          |
| Little thorn                                     | <i>Cepphis advenaria</i>        | LBAP[CLY]                       | 1                 | May 2017           |
| Satin lutestring                                 | <i>Tethella fluctuosa</i>       | LBAP[CLY]                       | 4                 | July 2022          |
| Silver-washed fritillary                         | <i>Argynnis paphia</i>          | LI[SEWBRcC]                     | 1                 | July 2021          |
| Southern hawk                                    | <i>Aeshna cyanea</i>            | LBAP[CLY]                       | 1                 | August 2022        |
| Speckled bush-cricket                            | <i>Leptophyes punctatissima</i> | LI[SEWBRcC]                     | 1                 | August 2022        |

**Table A-3 – Invasive non-native invertebrate species within 1km of the Scheme**

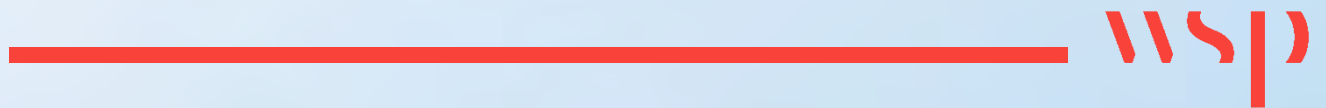
| <b>Invasive non-native species within 1km</b> |                           |  |                          |                           |
|---|---------------------------|--|--------------------------|---------------------------|
| <b>Common name</b>                            | <b>Scientific name</b>    | <b>Legislation/Conservation Status</b> | <b>Number of Records</b> | <b>Most Recent Record</b> |
| Harlequin ladybird                            | <i>Harmonia axyridis</i>  | INNS                                   | 2                        | October 2018              |
| Flatworm                                      | <i>Kontikia andersoni</i> | WCA9, INNS                             | 1                        | December 2015             |

**Table A-4 – Legislation/Conservation status abbreviation descriptions.**

| <b>Legislation/Conservation status abbreviation descriptions</b> |  |             |  |
|--|--|-------------|--|
| INNS   | Invasive Non-native Species  | RD2(UK)     | Red Data Book listing for the UK not based on IUCN guidelines  |
| LBAP   | Local Biodiversity Action Plan species for the listed area   | S7          | Environment (Wales) Act 2016 (Section 7)   |
| LBAP [CLY]   | Caerphilly County Borough Council Local Biodiversity Action Plan   | WCA9        | Wildlife & Countryside Act 1981 Schedule 9 (Non-native animals and plants which are established in the wild)                                     |
| RD1/RDB1(UK)   | Red Data Book listing for the UK based on IUCN guidelines<br><br>(CE = Critically Endangered, EN = Endangered, VU = Vulnerable, NT= Near Threatened, LC = Least Concern, DD = Data Deficient ) | LI          | Locally Important within the listed area   |
| S7   | Environment (Wales) Act 2016 (Section 7)   | LI (BIS)    | Locally Important Species (as identified by local specialists) Biodiversity Information Service (BIS) for Powys and Brecon Beacons National Park |
| RD1(UK)  | Red Data Book listing for the UK based on IUCN guidelines<br><br>(CE= Critically Endangered, EN= Endangered, VU= Vulnerable, NT= Near Threatened, LC=Least Concern)                            | LI (SEWBRc) | Locally Important Species (as identified by local specialists) in SEWBRc area  |
| RD1 (Wales)  | Red Data Book listing for Wales based on IUCN guidelines   |             |  |

# Appendix B

## INVERTEBRATE SURVEY DETAILS







**Table B-1 – Terrestrial invertebrate surveys**

| Survey visit number | Date of survey visit | Surveyors   | Weather conditions   |
|---------------------|----------------------|---|--|
| 1 Upper tip         | 07 June 2023         | Tara Okon (Ecologist)<br>Emma Carney (Senior Ecologist) | Temp 14°C - 21°C<br>Wind: 2 - 4<br>Humidity: 64%<br>Cloud cover: 0/8 |
| 1 Lower tip         | 08 June 2023         | Tara Okon (Ecologist)<br>Emma Carney (Senior Ecologist) | Temp 15°C - 23°C<br>Wind: 2 - 4<br>Humidity: 67%<br>Cloud cover: 0/8 |
| 2 Lower tip         | 25 July 2023         | Tara Okon (Ecologist)<br>Megan Watts (Ecologist)        | Temp 17°C - 19°C<br>Wind: 2 - 4<br>Humidity: 68%<br>Cloud cover: 4/8 |
| 2 Upper tip         | 26 July 2023         | Tara Okon (Ecologist)<br>Emma Carney (Senior Ecologist) | Temp 16°C - 17°C<br>Wind: 2 - 4<br>Humidity: 73%<br>Cloud cover: 4/8 |

*Key: Cloud: scale 0 - 8, 0 = clear skies, 4 = 50% cover, 8 = complete cloud cover*

*Wind: Beaufort scale 0 – 12 , 0 = calm, 2 = light breeze, 4 = moderate breeze, 6 = strong breeze, 7 = Moderate gale, 9 = Strong gale 12 = Hurricane*

# Appendix C

## **FULL LIST OF INVERTEBRATE SPECIES RECORDED**



**Table C-1 – Full list of invertebrate species recorded within the Scheme.**

| Scientific name                            | Common name                      | Family        | Order      | Conservation status/ distribution |
|--|----------------------------------|---------------|------------|-----------------------------------|
| <i>Agelena labyrinthica</i>                | Labyrinth spider                 | Agelenidae    | Araneae    |                                   |
| <i>Anyphaena accentuata</i>                | Buzzing spider species           | Anyphaenidae  | Araneae    |                                   |
| <i>Araneus quadratus</i>                   | Four-spotted orb weaver          | Araneidae     | Araneae    |                                   |
| <i>Mangora acalypha</i>                    | Cricket bat spider               | Araneidae     | Araneae    |                                   |
| <i>Araniella cucurbitina sensu stricto</i> | Cucumber spider                  | Araneidae     | Araneae    |                                   |
| <i>Larinioides</i> sp.                     | Orb-weaver spider species        | Araneidae     | Araneae    |                                   |
| <i>Clubiona comta</i>                      | Foliage spider                   | Clubionidae   | Araneae    |                                   |
| <i>Lycosidae</i> sp.                       | Wolf spider species              | Lycosidae     | Araneae    |                                   |
| <i>Oonops</i> sp.                          | <i>Oonops</i> species            | Oonopidae     | Araneae    |                                   |
| <i>Philodromus</i> sp.                     | Running crab spider species      | Philodromidae | Araneae    |                                   |
| <i>Tibellus</i> sp.                        | Running crab spider species      | Philodromidae | Araneae    |                                   |
| <i>Euophrys frontalis</i>                  | Jumping spider                   | Salticidae    | Araneae    |                                   |
| <i>Paidiscura pallens</i>                  | Sputnik spider                   | Theridiidae   | Araneae    |                                   |
| <i>Theridion varians</i>                   | Comb-footed spider               | Theridiidae   | Araneae    |                                   |
| <i>Xysticus</i> sp.                        | Crab spider species              | Thomisidae    | Araneae    |                                   |
| <i>Apionidae</i> sp.                       | Seed weevil                      | Apionidae     | Coleoptera |                                   |
| <i>Cantharis flavilabris</i>               | Soldier beetle                   | Cantharidae   | Coleoptera |                                   |
| <i>Rhagonycha fulva</i>                    | Common red soldier beetle        | Cantharidae   | Coleoptera |                                   |
| <i>Carabus violaceus</i>                   | Violet ground beetle             | Carabidae     | Coleoptera |                                   |
| <i>Cicindela campestris</i>                | Green tiger beetle               | Carabidae     | Coleoptera |                                   |
| <i>Harpalus affinis</i>                    | Metallic ground beetle           | Carabidae     | Coleoptera |                                   |
| <i>Pterostichus madidus</i>                | Common blackcock ground beetle   | Carabidae     | Coleoptera |                                   |
| <i>Clytus arietis</i>                      | Wasp beetle                      | Cerambycidae  | Coleoptera |                                   |
| <i>Rhagium bifasciatum</i>                 | Two-banded longhorn beetle       | Cerambycidae  | Coleoptera |                                   |
| <i>Rutpela maculata</i>                    | Black-and-yellow longhorn beetle | Cerambycidae  | Coleoptera |                                   |
| <i>Gastrophysa viridula</i>                | Green dock beetle                | Chrysomelidae | Coleoptera |                                   |
| <i>Gonioctena olivacea</i>                 | Broom leaf beetle                | Chrysomelidae | Coleoptera |                                   |
| <i>Neocrepidodera</i> sp.                  | Flea beetle                      | Chrysomelidae | Coleoptera |                                   |
| <i>Coccinella septempunctata</i>           | 7-spot ladybird                  | Coccinellidae | Coleoptera |                                   |
| <i>Exochomus quadripustulatus</i>          | Pine ladybird                    | Coccinellidae | Coleoptera |                                   |



| Scientific name                  | Common name                         | Family         | Order      | Conservation status/ distribution |
|----------------------------------|-------------------------------------|----------------|------------|-----------------------------------|
| <i>Phyllobius argentatus</i>     | Silver-green leaf weevil            | Curculionidae  | Coleoptera |                                   |
| <i>Phyllobius maculicornis</i>   | Green leaf weevil                   | Curculionidae  | Coleoptera |                                   |
| <i>Strophosoma melanogrammum</i> | Nut leaf weevil                     | Curculionidae  | Coleoptera |                                   |
| <i>Agriotes</i> sp.              | Click beetle species                | Elateridae     | Coleoptera |                                   |
| <i>Geotrupes</i> sp.             | Dor beetle species                  | Geotrupidae    | Coleoptera |                                   |
| <i>Oedemera nobilis</i>          | Swollen-thighed beetle              | Oedemeridae    | Coleoptera |                                   |
| <i>Phyllopertha horticola</i>    | Garden chafer                       | Scarabaeidae   | Coleoptera |                                   |
| <i>Trichius fasciatus</i>        | Bee chafer                          | Scarabaeidae   | Coleoptera | Local                             |
| <i>Scirtes hemisphaericus</i>    | Marsh beetle                        | Scirtidae      | Coleoptera |                                   |
| <i>Ocyopus olens</i>             | Devil's coach-horse                 | Staphylinidae  | Coleoptera |                                   |
| <i>Forficula dentata</i>         | Common earwig                       | Forficulidae   | Dermaptera |                                   |
| <i>Bibio marci</i>               | St Mark's fly                       | Bibionidae     | Diptera    |                                   |
| <i>Bombylius canescens</i>       | Western bee-fly                     | Bombyliidae    | Diptera    | Nationally Scarce                 |
| <i>Calliphora</i> sp.            | Bluebottle species                  | Calliphoridae  | Diptera    |                                   |
| <i>Calliphora vomitoria</i>      | Orange-bearded bluebottle           | Calliphoridae  | Diptera    |                                   |
| <i>Lucilia</i> sp.               | Greenbottle species                 | Calliphoridae  | Diptera    |                                   |
| <i>Conops quadrifasciatus</i>    | Four-banded beegrabber              | Conopidae      | Diptera    |                                   |
| <i>Sicus ferrugineus</i>         | Ferruginous bee-grabber             | Conopidae      | Diptera    |                                   |
| <i>Dryomyza anilis</i>           | Orange fungi fly                    | Dryomyzidae    | Diptera    |                                   |
| <i>Empis tessellata</i>          | Common dance fly                    | Empididae      | Diptera    |                                   |
| <i>Mesembrina meridiana</i>      | Noon fly                            | Muscidae       | Diptera    |                                   |
| <i>Chrysopilus cristatus</i>     | Black snipefly                      | Rhagionidae    | Diptera    |                                   |
| <i>Sarcophagidae</i> sp.         | Flesh-fly species                   | Sarcophagidae  | Diptera    |                                   |
| <i>Scathophaga stercoraria</i>   | Yellow dung fly                     | Scathophagidae | Diptera    |                                   |
| <i>Sepedon spegea</i>            | Blue long-horned snailkiller        | Sciomyzidae    | Diptera    |                                   |
| <i>Chrysotoxum</i> sp.           | <i>Chrysotoxum</i> hoverfly species | Syrphidae      | Diptera    |                                   |
| <i>Eristalis nemorum</i>         | Stripe-faced dronefly               | Syrphidae      | Diptera    |                                   |
| <i>Eristalis pertinax</i>        | Tapered drone fly                   | Syrphidae      | Diptera    |                                   |
| <i>Eristalis tenax</i>           | Common dronefly                     | Syrphidae      | Diptera    |                                   |
| <i>Episyrphus balteatus</i>      | Marmalade hoverfly                  | Syrphidae      | Diptera    |                                   |

| Scientific name                 | Common name                       | Family        | Order     | Conservation status/ distribution |
|---------------------------------|-----------------------------------|---------------|-----------|-----------------------------------|
| <i>Melanostoma scalare</i>      | Chequered hoverfly                | Syrphidae     | Diptera   |                                   |
| <i>Merodon equestris</i>        | Narcissus bulb fly                | Syrphidae     | Diptera   |                                   |
| <i>Myathropa Florea</i>         | Batman hoverfly                   | Syrphidae     | Diptera   |                                   |
| <i>Scaeva pyrastris</i>         | White-clubbed hoverfly            | Syrphidae     | Diptera   |                                   |
| <i>Scaeva selenitica</i>        | Yellow-clubbed hoverfly           | Syrphidae     | Diptera   |                                   |
| <i>Sphaerophoria scripta</i>    | Common twist-tailed hoverfly      | Syrphidae     | Diptera   |                                   |
| <i>Syritta pipiens</i>          | Thick-legged hoverfly             | Syrphidae     | Diptera   |                                   |
| <i>Syrphus ribesii</i>          | Humming syrphus                   | Syrphidae     | Diptera   |                                   |
| <i>Volucella bombylans</i>      | Bumblebee hoverfly                | Syrphidae     | Diptera   |                                   |
| <i>Volucella pellucens</i>      | Pellucid hoverfly                 | Syrphidae     | Diptera   |                                   |
| <i>Xylota segnis</i>            | Orange-belted leaf licker         | Syrphidae     | Diptera   |                                   |
| <i>Haematopota pluvialis</i>    | Notch-horned cleg horsefly        | Tabanidae     | Diptera   |                                   |
| <i>Tabanus bromius</i>          | Band-eyed brown horsefly          | Tabanidae     | Diptera   |                                   |
| <i>Eriothrix rufomaculata</i>   | Red-sided <i>Eriothrix</i>        | Tachinidae    | Diptera   |                                   |
| <i>Nowickia ferox</i>           | Fat-palped tachina                | Tachinidae    | Diptera   |                                   |
| <i>Tachina fera</i>             | Tachinid fly                      | Tachinidae    | Diptera   |                                   |
| <i>Nephrotoma appendiculata</i> | Spotted crane fly                 | Tipulidae     | Diptera   |                                   |
| <i>Tipula oleracea</i>          | Common crane fly                  | Tipulidae     | Diptera   |                                   |
| <i>Tipula vernalis</i>          | Black-striped crane fly           | Tipulidae     | Diptera   |                                   |
| <i>Herina lugubris</i>          | Four-spotted wing waver           | Ulidiidae     | Diptera   |                                   |
| <i>Anthocoris nemorum</i>       | Common flower bug                 | Anthocoridae  | Hemiptera |                                   |
| <i>Phyllaphis fagi</i>          | Wolly beech aphid                 | Aphididae     | Hemiptera |                                   |
| <i>Aphrophoridae</i> spp.       | Leafhopper/planthopper species    | Aphrophoridae | Hemiptera |                                   |
| <i>Cercopis vulnerata</i>       | Red-and-black frog hopper         | Cercopidae    | Hemiptera |                                   |
| <i>Cercopoidea</i> spp.         | Frog hopper species (cuckoo spit) | Cercopoidea   | Hemiptera |                                   |
| <i>Cicadella viridis</i>        | Green leafhopper                  | Cicadellidae  | Hemiptera |                                   |
| <i>Idiocerus</i> sp.            | Leafhopper (nymph) species        | Cicadellidae  | Hemiptera |                                   |
| <i>Coreus marginatus</i>        | Dock bug                          | Coreidae      | Hemiptera |                                   |
| <i>Conomelus anceps</i>         | Planthopper                       | Delphacidae   | Hemiptera |                                   |
| <i>Megalonotus</i> sp.          | Ground bug species                | Lygaeidae     | Hemiptera |                                   |

| Scientific name                | Common name              | Family        | Order       | Conservation status/ distribution |
|--------------------------------|--------------------------|---------------|-------------|-----------------------------------|
| <i>Acetropis gimmerthalii</i>  | Mirid bug                | Miridae       | Hemiptera   |                                   |
| <i>Atractotomus</i> sp.        | Mirid bug                | Miridae       | Hemiptera   |                                   |
| <i>Leptopterna dolabrata</i>   | Meadow plant bug         | Miridae       | Hemiptera   |                                   |
| <i>Myrmus miriformis</i>       | Mirid bug                | Miridae       | Hemiptera   |                                   |
| <i>Notostira elongata</i>      | Elongated mirid bug      | Miridae       | Hemiptera   |                                   |
| <i>Orthocephalus</i> sp.       | Plant bug species        | Miridae       | Hemiptera   |                                   |
| <i>Orthops campestris</i>      | Capsid plant bug         | Miridae       | Hemiptera   |                                   |
| <i>Stenodema laevigata</i>     | Mirid bug                | Miridae       | Hemiptera   |                                   |
| <i>Aelia acuminata</i>         | Bishop's mitre shieldbug | Pentatomidae  | Hemiptera   |                                   |
| <i>Dolycoris baccarum</i>      | Hairy shieldbug          | Pentatomidae  | Hemiptera   |                                   |
| <i>Palomena prasina</i>        | Green shieldbug          | Pentatomidae  | Hemiptera   |                                   |
| <i>Piezodorus lituratus</i>    | Gorse shieldbug          | Pentatomidae  | Hemiptera   |                                   |
| <i>Eurygaster testudinaria</i> | Tortoise shieldbug       | Scutelleridae | Hemiptera   |                                   |
| <i>Andrena cineraria</i>       | Ashy mining bee          | Andrenidae    | Hymenoptera |                                   |
| <i>Andrena denticulata</i>     | Grey-banded mining bee   | Andrenidae    | Hymenoptera |                                   |
| <i>Andrena haemorrhoa</i>      | Orange-tailed mining bee | Andrenidae    | Hymenoptera |                                   |
| <i>Andrena nitida</i>          | Grey-patched mining bee  | Andrenidae    | Hymenoptera |                                   |
| <i>Andrena</i> spp.            | Andrena species          | Andrenidae    | Hymenoptera |                                   |
| <i>Anthophora plumipes</i>     | Hairy-footed flower bee  | Apidae        | Hymenoptera |                                   |
| <i>Apis mellifera</i>          | Honey bee                | Apidae        | Hymenoptera |                                   |
| <i>Bombus hortorum</i>         | Garden bumblebee         | Apidae        | Hymenoptera |                                   |
| <i>Bombus hypnorum</i>         | Tree bumblebee           | Apidae        | Hymenoptera |                                   |
| <i>Bombus lapidarius</i>       | Red-tailed bumblebee     | Apidae        | Hymenoptera |                                   |
| <i>Bombus pascuorum</i>        | Common carder bee        | Apidae        | Hymenoptera |                                   |
| <i>Bombus terrestris</i>       | Buff-tailed bumblebee    | Apidae        | Hymenoptera |                                   |
| <i>Crabronidae</i> sp.         | Digger wasp species      | Crabronidae   | Hymenoptera |                                   |
| <i>Lasius niger</i>            | Small black ant          | Formicidae    | Hymenoptera |                                   |
| <i>Lasius</i> sp.              | Black ant species        | Formicidae    | Hymenoptera |                                   |
| <i>Lasius</i> sp.              | Yellow ant species       | Formicidae    | Hymenoptera |                                   |
| <i>Myrmica scabrinodis</i>     | Common red ant           | Formicidae    | Hymenoptera |                                   |
| <i>Lasioglossum calceatum</i>  | Common furrow-bee        | Halictidae    | Hymenoptera |                                   |
| <i>Sphecodes</i> sp.           | Blood bee species        | Halictidae    | Hymenoptera |                                   |



| Scientific name                    | Common name   | Family         | Order          | Conservation status/ distribution |
|------------------------------------|---|----------------|----------------|-----------------------------------|
| <i>Megachile willughbiella</i>     | Willughby's leafcutter bee                          | Megachilidae   | Hymenoptera    |                                   |
| <i>Tenthredinidae</i> sp.          | Sawfly species (larva)                              | Tenthredinidae | Hymenoptera    |                                   |
| <i>Ancistrocerus trifasciatus</i>  | Three-banded mason wasp                             | Vespidae       | Hymenoptera    |                                   |
| <i>Dolichovespula sylvestris</i>   | Tree wasp   | Vespidae       | Hymenoptera    |                                   |
| <i>Vespa crabro</i>                | Hornet  | Vespidae       | Hymenoptera    |                                   |
| <i>Vespula germanica</i>           | German wasp   | Vespidae       | Hymenoptera    |                                   |
| <i>Vespula vulgaris</i>            | Common wasp   | Vespidae       | Hymenoptera    |                                   |
| <i>Porcellio scaber</i>            | Common rough woodlouse                              | Porcellionidae | Isopoda        |                                   |
| <i>Julidae</i> sp.                 | Millipede species                                   | Julidae        | Julida         |                                   |
| <i>Lithobiidae</i> sp.             | Centipede species                                   | Lithobiidae    | Lithobiomorpha |                                   |
| <i>Agriphila inquinatella</i>      | Barred grass-veneer                                 | Crambidae      | Lepidoptera    |                                   |
| <i>Crambus pascuella</i>           | <i>Crambus pascuella</i> (micro moth)               | Crambidae      | Lepidoptera    |                                   |
| <i>Pyrausta aurata</i>             | Mint moth   | Crambidae      | Lepidoptera    |                                   |
| <i>Cabera pusaria</i>              | Common white wave                                   | Ennominae      | Lepidoptera    |                                   |
| <i>Cepphis advenaria</i>           | Little thorn  | Ennominae      | Lepidoptera    | Nationally Scarce                 |
| <i>Tyria jacobaeae</i>             | Cinnabar  | Erebidae       | Lepidoptera    | S7                                |
| <i>Atolmis rubricollis</i>         | Red-necked footman                                  | Erebidae       | Lepidoptera    | Local                             |
| <i>Dyseriocrania subpurpurella</i> | <i>Dyseriocrania subpurpurella</i> (oak leaf miner) | Eriocraniidae  | Lepidoptera    |                                   |
| <i>Gymnoscelis rufifasciata</i>    | Double-striped pug                                  | Geometridae    | Lepidoptera    |                                   |
| <i>Scotopteryx chenopodiata</i>    | Shaded broad-bar                                    | Geometridae    | Lepidoptera    | S7                                |
| <i>Phyllonorycter nicelli</i>      | <i>Phyllonorycter nicelli</i> (hazel leaf miner)    | Gracillariidae | Lepidoptera    |                                   |
| <i>Erynnis tages</i>               | Dingy skipper                                       | Hesperiidae    | Lepidoptera    | S7, RDB1 (UK) – VU, Local         |
| <i>Ochlodes sylvanus</i>           | Large skipper                                       | Hesperiidae    | Lepidoptera    |                                   |
| <i>Thymelicus sylvestris</i>       | Small skipper                                       | Hesperiidae    | Lepidoptera    |                                   |
| <i>Celastrina argiolus</i>         | Holly blue  | Lycaenidae     | Lepidoptera    |                                   |
| <i>Lycaena phlaeas</i>             | Small copper  | Lycaenidae     | Lepidoptera    |                                   |
| <i>Polyommatus icarus</i>          | Common blue   | Lycaenidae     | Lepidoptera    |                                   |
| <i>Stigmella</i> sp.               | Hazel leaf mining moth species                      | Nepticulidae   | Lepidoptera    |                                   |
| <i>Amphipyra pyramidea</i> agg.    | Copper underwing                                    | Noctuidae      | Lepidoptera    |                                   |
| <i>Autographa gamma</i>            | Silver Y  | Noctuidae      | Lepidoptera    |                                   |

| Scientific name                   | Common name                                    | Family           | Order       | Conservation status/ distribution |
|-----------------------------------|--|------------------|-------------|-----------------------------------|
| <i>Callistege mi</i>              | Mother shipton                                 | Noctuidae        | Lepidoptera |                                   |
| <i>Lacanobia oleracea</i>         | Bright-line brown-eye                          | Noctuidae        | Lepidoptera |                                   |
| <i>Aglais io</i>                  | Peacock  | Nymphalidae      | Lepidoptera |                                   |
| <i>Aglais urticae</i>             | Small tortoiseshell                            | Nymphalidae      | Lepidoptera |                                   |
| <i>Aphantopus hyperantus</i>      | Ringlet  | Nymphalidae      | Lepidoptera |                                   |
| <i>Maniola jurtina</i>            | Meadow brown                                   | Nymphalidae      | Lepidoptera |                                   |
| <i>Polygonia c-album</i>          | Comma  | Nymphalidae      | Lepidoptera |                                   |
| <i>Pyronia tithonus</i>           | Gatekeeper                                     | Nymphalidae      | Lepidoptera |                                   |
| <i>Coenonympha pamphilus</i>      | Small heath                                    | Nymphalidae      | Lepidoptera | S7, RDB1 (UK) - NT                |
| <i>Hipparchia semele</i>          | Grayling                                       | Nymphalidae      | Lepidoptera | S7, RDB1 (UK) – VU, Local         |
| <i>Pararge aegeria</i>            | Speckled wood                                  | Nymphalidae      | Lepidoptera |                                   |
| <i>Vanessa atalanta</i>           | Red admiral                                    | Nymphalidae      | Lepidoptera |                                   |
| <i>Vanessa cardui</i>             | Painted lady                                   | Nymphalidae      | Lepidoptera |                                   |
| <i>Gonepteryx rhamni</i>          | Brimstone                                      | Pieridae         | Lepidoptera |                                   |
| <i>Pieris brassicae</i>           | Large white                                    | Pieridae         | Lepidoptera |                                   |
| <i>Pieris napi</i>                | Green-veined white                             | Pieridae         | Lepidoptera |                                   |
| <i>Pieris rapae</i>               | Small white                                    | Pieridae         | Lepidoptera |                                   |
| <i>Synanthedon formicaeformis</i> | Red-tipped clearwing                           | Sesiidae         | Lepidoptera | Nationally Scarce                 |
| <i>Deilephila elpenor</i>         | Elephant hawk-moth                             | Sphingidae       | Lepidoptera |                                   |
| <i>Cydia ulicetana</i>            | Gorse piercer moth                             | Tortricidae      | Lepidoptera |                                   |
| <i>Ypsolopha scabrella</i>        | Wainscot hooktip                               | Ypsolophidae     | Lepidoptera |                                   |
| <i>Panorpa communis</i>           | Scorpion fly                                   | Panorpidae       | Mecoptera   |                                   |
| <i>Chrysopidae</i> sp.            | Lacewing species                               | Chrysopidae      | Neuroptera  |                                   |
| <i>Aeshna cyanea</i>              | Southern hawker                                | Aeshnidae        | Odonata     |                                   |
| <i>Aeshna mixta</i>               | Migrant hawker                                 | Aeshnidae        | Odonata     |                                   |
| <i>Coenagrion puella</i>          | Azure damselfly                                | Coenagrionidae   | Odonata     |                                   |
| <i>Pyrrhosoma nymphula</i>        | Large red damselfly                            | Coenagrionidae   | Odonata     |                                   |
| <i>Cordulegaster boltonii</i>     | Golden-ringed dragonfly                        | Cordulegastridae | Odonata     |                                   |
| <i>Libellula depressa</i>         | Broad-bodied chaser                            | Libellulidae     | Odonata     |                                   |
| <i>Libellula quadrimaculata</i>   | Four-spotted chaser                            | Libellulidae     | Odonata     |                                   |
| <i>Sympetrum striolatum</i>       | Common darter                                  | Libellulidae     | Odonata     |                                   |
| <i>Dicranopalpus ramosus</i> agg. | <i>Dicranopalpus ramosus</i> agg. (harvestman) | Phalangiidae     | Opiliones   |                                   |

| Scientific name                 | Common name                          | Family        | Order           | Conservation status/ distribution |
|---------------------------------|--------------------------------------|---------------|-----------------|-----------------------------------|
| <i>Chorthippus brunneus</i>     | Common field grasshopper             | Acrididae     | Orthoptera      |                                   |
| <i>Chorthippus parallelus</i>   | Meadow grasshopper                   | Acrididae     | Orthoptera      |                                   |
| <i>Myrmeleotettix maculatus</i> | Mottled grasshopper                  | Acrididae     | Orthoptera      |                                   |
| <i>Omocestus viridulus</i>      | Common green grasshopper             | Acrididae     | Orthoptera      |                                   |
| <i>Leptophyes punctatissima</i> | Speckled bush-cricket                | Tettigoniidae | Orthoptera      |                                   |
| <i>Meconema thalassinum</i>     | Oak bush-cricket                     | Tettigoniidae | Orthoptera      |                                   |
| <i>Tetrix undulata</i>          | Common groundhopper                  | Tetrigidae    | Orthoptera      |                                   |
| <i>Arion ater</i> agg.          | Black slug                           | Arionidae     | Stylommatophora |                                   |
| <i>Cepaea hortensis</i>         | White-lipped snail                   | Helicidae     | Stylommatophora |                                   |
| <i>Cepaea nemoralis</i>         | Brown-lipped snail                   | Helicidae     | Stylommatophora |                                   |
| <i>Helix aspersa</i>            | Garden snail                         | Helicidae     | Stylommatophora |                                   |
| <i>Lehmanna marginata</i>       | Tree slug                            | Limacidae     | Stylommatophora |                                   |
| <i>Dicyrtomina</i> sp.          | Globular springtail species          | Dicyrtomidae  | Symphyleona     |                                   |
| <i>Trombidiidae</i> sp.         | Velvet Mite agg.                     | Trombidiidae  | Trombidiformes  |                                   |
| <b>Aquatic invertebrates</b>    |                                      |               |                 |                                   |
| <i>Acilius sulcatus</i>         | Lesser diving beetle                 | Dytiscidae    | Coleoptera      |                                   |
| <i>Gyrinus</i> sp.              | Whirligig beetle                     | Gyrinidae     | Coleoptera      |                                   |
| <i>Chironomidae</i> sp.         | Chironomid non-biting midge (larvae) | Chironomidae  | Diptera         |                                   |
| <i>Gerris</i> sp.               | Pond skater                          | Gerridae      | Hemiptera       |                                   |



# Appendix D







## PHOTOGRAPHS



**Table D-1 – Invertebrate Survey supporting photographs.**

|  |   |
|--|---|
|  |   |
| <p>1. Cattle and sheep-grazed marshy grassland on Mynydd y Grug common, north-west of Upper Tip (June 2023)</p>                            | <p>2. Acid grassland, heathland, and lichen/bryophyte mosaic on the western slope of Upper Tip (June 2023).</p> |
|  |   |
| <p>3. Continuous bracken west of Upper Tip (June 2023)</p>   | <p>4. Pond in Mynydd y Grug SINC at northernmost extent of Scheme (June 2023).</p>                              |
|  |   |
| <p>5. Colliery spoil on Lower Tip (looking south from top of Lower Tip) broadleaved woodland at eastern and southern edges (June 2023)</p> | <p>6. Dense scrub at southerly edges of Lower Tip (June 2023).</p>  |



|  |   |
|--|---|
|   |   |
| <p>7. Bee chafer (incidental record) on pearly everlasting (<i>Anaphalis margaritacea</i>) near easternmost extent of haul road. (July 2023)</p> | <p>8. Western bee-fly found on gravel path west of Lower Tip near top. (June 2023)</p>  |
|    |    |
| <p>9. Little thorn (incidental record) in bramble and bracken scrub at southern extent of Scheme. (June 2023)</p>                                | <p>10. Cinnabar moth caterpillars on ragwort (<i>Senecio jacobaea</i>) next to dirt/gravel path on eastern edge of Lower Tip's southern extent. (July 2023)</p> |
|   |    |
| <p>11. Red-necked footman (incidental record) near quarry pond at the south-east extent of the Scheme. (June 2023)</p>                           | <p>12. Dingy skipper near dirt/gravel path on eastern side of Lower Tip. (June 2023)</p>  |



|  |  |
|--|--|
|   |                                    |
| <p>13. Small heath butterfly on grass verge north of the haul road at edge of its western extent. (July 2023).</p>             | <p>14. Grayling (incidental record) at edge of haul road. (July 2023)</p>  |
|    |                                   |
| <p>15. Red-tipped clearwing (one of two attracted to pheromone lure) near willow species at southern extent of the Scheme.</p> | <p>16. Azure damselfly near pond at northernmost extent of Scheme. (June 2023).</p>                                  |
|   |                                  |
| <p>17. Common darter (incidental record) on scrub at southern extent of Scheme. (August 2023)</p>                              | <p>18. Speckled bush-cricket on grass slope verge near scrub/scattered tree, west of Lower Tip top. (June 2023).</p> |

# Appendix E

## **KEY MOTH & BUTTERFLY SPECIES AND ASSOCIATED FOOD PLANTS**



**Table E-1 – Key moth & butterfly species and associated food plants**

| Common name                                      | Scientific name            | Food plants   |
|--|----------------------------|---|
| <b>Protected and priority species within 1km</b> |                            |   |
| Autumnal rustic                                  | <i>Eugnorisma glareosa</i> | Includes bedstraws ( <i>Galium</i> spp.), birches ( <i>Betula</i> spp.), bluebell ( <i>Hyacinthoides non-scripta</i> ), broom ( <i>Cytisus scoparius</i> ), docks ( <i>Rumex</i> spp.), heather ( <i>Calluna vulgaris</i> ), bell heather ( <i>Erica cinerea</i> ), plantains ( <i>Plantago</i> spp.), sheep's-fescue ( <i>Festuca ovina</i> ), common vetch ( <i>Vicia sativa</i> subsp. <i>segetalis</i> ), and creeping willow ( <i>Salix repens</i> ).  |
| Brindled beauty                                  | <i>Lycia hirtaria</i>      | Alder ( <i>Alnus glutinosa</i> ), aspen ( <i>Populus tremula</i> ), beech ( <i>Fagus sylvatica</i> ), downy ( <i>Betula pubescens</i> ) and silver birches ( <i>Betula pendula</i> ), alder buckthorn ( <i>Frangula alnus</i> ), elms ( <i>Ulmus</i> spp.), hawthorns ( <i>Crataegus</i> spp.), hazel ( <i>Corylus avellana</i> ), small-leaved lime ( <i>Tilia cordata</i> ), pedunculate ( <i>Quercus robur</i> ) and holm oaks ( <i>Quercus ilex</i> ), pear ( <i>Pyrus communis</i> ), plum ( <i>Prunus</i> sp.), and willows ( <i>Salix</i> spp.).   |
| Broom moth                                       | <i>Ceramica pisi</i>       | Includes sea aster ( <i>Aster tripolium</i> ), bilberry ( <i>Vaccinium myrtillus</i> ), birches, bog-myrtle ( <i>Myrica gale</i> ), bracken ( <i>Pteridium aquilinum</i> ), bramble ( <i>Rubus fruticosus</i> agg.), broom ( <i>Cytisus scoparius</i> ), docks ( <i>Rumex</i> spp.), dog-rose ( <i>Rosa canina</i> ), elms, heather, yellow iris ( <i>Iris pseudacorus</i> ), sea-buckthorn ( <i>Hippophae rhamnoides</i> ), creeping ( <i>Cirsium arvense</i> ) and marsh thistles ( <i>Cirsium palustre</i> ), and common toadflax ( <i>Linaria vulgaris</i> ). Also recorded on larches ( <i>Larix</i> spp.), pines ( <i>Pinus</i> spp.), and spruces ( <i>Picea</i> spp.), and young plantations of Sitka spruce ( <i>Picea sitchensis</i> ).   |
| Buff ermine                                      | <i>Spilosoma lutea</i>     | Includes balm ( <i>Melissa officinalis</i> ), barberry ( <i>Berberis vulgaris</i> ), birches, elder ( <i>Sambucus nigra</i> ), honeysuckle ( <i>Lonicera periclymenum</i> ), hop ( <i>Humulus lupulus</i> ), common ivy ( <i>Hedera helix</i> ), jasmines ( <i>Jasminum</i> spp.), common nettle ( <i>Urtica dioica</i> ), nipplewort ( <i>Lapsana communis</i> ), wild plum ( <i>Prunus domestica</i> ), common ragwort ( <i>Senecio jacobaea</i> ), and Virginia-creeper ( <i>Parthenocissus quinquefolia</i> ). Eggs and first instar also blackthorn ( <i>Prunus spinosa</i> ), hawthorn, pedunculate oak, rowan ( <i>Sorbus aucuparia</i> ), whitebeams ( <i>Sorbus</i> spp.), and grey willow ( <i>Salix cinerea</i> subsp. <i>cinerea</i> ). |



| Common name                  | Scientific name                 | Food plants   |
|------------------------------|---------------------------------|---|
| Cinnabar                     | <i>Tyria jacobaeae</i>          | Mainly common ragwort. Also, colt's-foot ( <i>Tussilago farfara</i> ), oxeye daisy ( <i>Leucanthemum vulgare</i> ), flixweed ( <i>Descurainia sophia</i> ), groundsel ( <i>Senecio vulgaris</i> ), heath groundsel ( <i>Senecio sylvaticus</i> ), hop, great mullein ( <i>Verbascum Thapsus</i> ), other ragwort species ( <i>Senecio</i> spp.), wood sage ( <i>Teucrium scorodonia</i> ) and yarrow ( <i>Achillea millefolium</i> ).   |
| Dark-barred twin-spot carpet | <i>Xanthorhoe ferrugata</i>     | Include bedstraws, dandelions ( <i>Taraxacum officinale</i> agg.), docks, ground-ivy ( <i>Glechoma hederacea</i> ), and knotgrass ( <i>Polygonum aviculare</i> ).   |
| Dingy skipper                | <i>Erynnis tages</i>            | Most commonly common bird's-foot-trefoil ( <i>Lotus corniculatus</i> ). Also, greater bird's-foot-trefoil ( <i>Lotus pedunculatus</i> ) and horseshoe vetch ( <i>Hippocrepis comosa</i> ).  |
| Feathered gothic             | <i>Tholera decimalis</i>        | Hard-bladed grasses including mat-grass ( <i>Nardus stricta</i> ) and sheep's-fescue ( <i>Festuca ovina</i> ). Also, meadow-grasses ( <i>Poa</i> spp.).   |
| Flounced chestnut            | <i>Anchoscelis helvola</i>      | Birches, elms, hawthorn, heather, oaks, burnet rose ( <i>Rosa spinosissima</i> ) and willows.   |
| Forester                     | <i>Adscita staites</i>          | Common sorrel ( <i>Rumex acetosa</i> subsp. <i>acetosa</i> ) and sheep's sorrel ( <i>Rumex acetosella</i> ).  |
| Knot grass                   | <i>Acronicta rumicis</i>        | Includes broad-leaved dock ( <i>Rumex obtusifolius</i> ) and plantains ( <i>Plantago</i> spp.). Also, agrimony ( <i>Agrimonia eupatoria</i> ), bilberry, birches, bramble, hawthorn, heather, hop, stinking iris ( <i>Iris foetidissima</i> ), knotgrass, water mint ( <i>Mentha aquatica</i> ), peach ( <i>Prunus persica</i> ), purple-loosestrife ( <i>Lythrum salicaria</i> ), rhubarb ( <i>Rheum palmatum</i> x <i>rhaponticum</i> = <i>R. x hybridum</i> ), burnet rose, common sorrel, wild strawberry ( <i>Fragaria vesca</i> ), thistles, and willows. |
| Sallow                       | <i>Cirrhia icteritia</i>        | Catkins of poplars ( <i>Populus</i> spp.) and willows, sometimes seeds of wych elm ( <i>Ulmus glabra</i> ). Also, dandelions and docks.   |
| Shaded broad-bar             | <i>Scotopteryx chenopodiata</i> | Clovers ( <i>Trifolium</i> spp.) and vetches ( <i>Vicia</i> spp.).  |
| Small heath                  | <i>Coenonympha pamphilus</i>    | Fine grasses including bents ( <i>Agrostis</i> spp.), fescues ( <i>Festuca</i> spp.) and meadow-grasses. Also crested dog's-tail ( <i>Cynosurus cristatus</i> ), mat-grass and tor-grass ( <i>Brachypodium rupestre</i> ).  |
| Small phoenix                | <i>Ecliptopera silaceata</i>    | Broad-leaved ( <i>Epilobium montanum</i> ), great ( <i>Epilobium hirsutum</i> ) and   |



| Common name                                | Scientific name              | Food plants  |
|--|------------------------------|--|
|  |                              | rosebay willowherb ( <i>Chamerion angustifolium</i> ). Also, Himalayan balsam ( <i>Impatiens glandulifera</i> ), touch-me-not-balsam ( <i>Impatiens noli-tangere</i> ), and enchanter's-nightshade ( <i>Circaea lutetiana</i> ). |
| White ermine                               | <i>Spilosoma lubricipeda</i> | Includes docks, common nettle, and common ragwort.   |
| <b>Species of Local Concern within 1km</b> |                              |  |
| Little thorn                               | <i>Cepphis advenaria</i>     | Bilberry, bramble, dog-rose, and dogwood.  |
| Satin lutestring                           | <i>Tetheella fluctuosa</i>   | Alder and birches.   |
| Silver-washed fritillary                   | <i>Argynnis paphia</i>       | Common dog-violet ( <i>Viola riviniana</i> ) and sweet violet ( <i>Viola odorata</i> ).  |



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