



Bute Energy
Aberedw Energy Park

Appendix 7.3:

Aberedw Energy Park Protected Species Surveys

Aberedw Energy Park Ltd

Aberedw Energy Park Environmental Statement

Appendix 7.3: Protected Species Survey Report

Final report

Prepared by LUC

June 2025



Aberedw Energy Park Ltd

Aberedw Energy Park Environmental Statement
Appendix 7.3: Protected Species Survey Report

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Chapter 1

Introduction

1.1 This Appendix details the full methods and results of the protected species surveys undertaken to inform the Ecological Impact Assessment (EclA) of the proposed Aberedw Energy Park (hereafter referred to as the 'Proposed Development'). The EclA is provided in **Chapter 7: Ecology (non-avian)** of the Environmental Statement (ES).

Supporting Documents

1.2 This Appendix supports the EclA in addition to the following Appendices:

- **Appendix 7.1: Desk Study**
- **Appendix 7.2: Habitat Survey Report**
- **Appendix 7.4: Bat Survey Report**
- **Appendix 7.5: Outline Habitat Management Plan (oHMP)**

1.3 This Appendix is supported by the following figures which can be found in **Volume 2: Figures** of the ES:

- **Figure 7.2: Ecology Survey Area**
- **Figure 7.4: Pond Locations and Great Crested Newt (GCN) Results**

Terminology and Survey Areas

1.4 The following terminology will be used throughout this Appendix:

- **Site**
 - All land within the red-line boundary (as shown in **Figure 7.2**). The Site includes the Access Road and Substation Areas (see below).
- **Access Road Area**
 - The proposed access road entering the northeast of the Site (as shown in **Figure 7.2**).
- **Northern Substation Area**
 - The proposed substation connection area in the far north of the Site (as shown in **Figure 7.2**).
- **Southern Fields Area**
 - Fields and wooded valley of the Cwmblaenerw Brook at southern end of Site

■ Proposed Development

- Encompasses the construction of an 18-turbine wind farm and associated infrastructure including access tracks, crane hardstandings, borrow pits, substation compound and underground cabling (described in detail in **Chapter 4** of the ES).

■ Ecology Survey Area (ESA)

- The red-line boundary area (shown on **Figure 7.2**) plus a buffer in which all ecology surveys were undertaken in line with good practice guidelines for all ecological features surveyed. For protected species this comprised the Site plus a series of buffers, where accessible, which are outlined below:
- Badger survey within the Proposed Development and a 100m buffer.
- Great crested newt (GCN) surveys within a survey area encompassing the Proposed Development and a 250m buffer.
- Otter survey within a survey buffer area of watercourse habitat up to a minimum of 250m upstream and downstream of the Proposed Development, where access was granted. A search was undertaken of the riparian zone and up to 20m away from the water's edge (where suitable habitat was found to be present).

1.8 Surveys for the following European Protected Species (EPS) have been undertaken:

- Badger;
- Great crested newt (GCN); and
- Otter (and signs of water vole).

1.9 The bat surveys, including the methods, findings, and interpretation of the results are addressed separately in **Appendix 7.4**.

1.10 Reference should be made to **Chapter 8: Ornithology** for details of the ornithological survey and assessment.

Scope

1.5 In December 2023, LUC submitted a Scoping Report¹ (**Appendix 2.1**) on behalf of Aberedw Energy Park Ltd ('the Applicant') as a means of agreeing the full scope of surveys with relevant consultees to inform the EclA.

1.6 The Scoping Report proposed to scope out surveys for water vole, reptiles, red squirrel, pine marten, fish and aquatic species because 'either species are not present, not impacted or impacts not significant due to nature of works and established Outline CEMP approaches and techniques'.

1.7 NRW responded by stating: '*We advise the site is subject to an assessment to determine the likelihood of protected species and that targeted species surveys are undertaken for all species scoped in*'. NRW expressed concern regarding scoping out surveys for fish and aquatic species, given that works will cross watercourses. Further information on our assessment and scoping for these species is therefore provided in **Chapter 3**.

¹ LUC (2023). Aberedw Energy Park: EIA Scoping Report.

Chapter 2

Method

Desk Study

2.1 A desk study² was undertaken by Environment Systems (2021) to inform the protected species surveys. This desk study was then updated by LUC in May 2025. An account of the desk study's adopted methods and findings is provided in **Appendix 7.1**.

Field Surveys

Assessing potential for protected species

2.2 An initial habitat survey of the Site was undertaken by Environment Systems in October 2020 (see **Appendix 7.2**). This was solely a habitat survey and was not 'extended' to assess potential for protected species.

2.3 LUC conducted surveys to assess the Site for potential for protected species on 16-17th October 2023 undertaken by suitably qualified and experienced LUC ecologists. This survey included an otter, water vole and badger survey. In addition, habitat and NVC surveys on the following dates also contributed to protected species knowledge:

- 18th-20th June 2024 - habitat walkover, NVC surveys, protected species potential:
- 28th-29th August 2024 - habitat walkover, NVC surveys, protected species potential.

2.4 Separate extended Phase 1 Habitat Surveys, extended to include an assessment of the potential for protected species were undertaken on specific parts of the Site as follows:

- Access Road Area: 28th June 2024 and 6th-7th March 2025. This survey included searching for signs of badger, otter, water vole and suitable habitat for GCN.
- Northern Substation Area: 6th-7th March 2025. This survey included searching for signs of badger, otter and water vole.
- Southern Fields Area: May 2025. This comprised an extended Phase 1 Habitat survey, including searching for signs of dormouse, badger, otter and water vole.

² Environment Systems (2020) Aberedw Desk Study Results; Biodiversity Information Centre for Powys and Brecon Beacons National Park (BIS)

Overview

2.5 The turbine layout at the time of the LUC surveys extended up to 18 turbines and associated infrastructure (the EIA Scoping layout); the survey was based on the footprint, oversail and anticipated land take of the 18-turbine layout.

2.6 Surveys were completed by suitably qualified and experienced field ecologists, in appropriate weather conditions, in line with best practice guidance³. Data was collected on GIS-enabled field tablets to increase accuracy and facilitate robust interpretation. Where field evidence was recorded, photographs were taken for post-survey analysis.

2.7 Surveys sought to identify suitable habitat for, and, where appropriate, direct evidence of, protected species. Suitable habitat was considered to include opportunities for shelter/protection, habitation/rest, foraging and commuting. All surveys followed good practice methods⁴ as detailed below.

Badger

2.8 Badger surveys were undertaken in accordance with best practice guidelines^{5,6,7}. Surveys sought to identify suitable habitat for, and direct evidence of, badger. Suitable habitat was considered to be sheltered areas with free-draining soils; including woodland, hedgerows, scrub, bracken, earth banks, or mosaics that incorporate these habitat types. Where suitable habitat was identified, direct evidence was searched for, including:

- Badger setts (as defined in **Table 2.1**);
- Tracks, prints, and paths (including scratched logs and fallen wood);
- Guard hair;
- Latrines and dung pits (categorised as fresh, recent or old);
- Snuffle holes (i.e. surface foraging); and
- Feeding remains.

Table 2.1 Badger Sett Definitions

Sett Type	Definition
Main	These usually have a large number of entrances with large spoil heaps. The sett

Sett Type	Definition
	generally looks well used. They may have well used paths to and from the sett and between sett entrances.
Annexe	These usually have a large number of entrances with large spoil heaps. The sett generally looks well used and is connected to the main sett by clear tracks and paths.
Subsidiary	These setts often only have a few entrances and are located at least 50m from a main sett. They are not continuously active and evidence may be limited.
Outlier	These setts may have only one or two entrances with little spoil. Used sporadically, these setts often show little signs of use.

Great Crested Newt (GCN)

Habitat Suitability Index

2.9 Habitat Suitability Index (HSI) surveys were undertaken of 53 ponds by ITP Energised in 2023 (see **Table 3.1** below. **Figure 7.4** shows pond locations). In addition, pond A61 in the Northern Substation Area and pond A62 south of the Access Road Area were subject to HSI survey in March 2025 and June 2024 respectively.

2.10 An additional five ponds (A1, A3, A5, A6 and A57) were beyond the Site boundary, over 350m from the Proposed Development, and access to these was not granted and therefore these were not subject to survey.

2.11 The HSI is a measure of habitat suitability for GCN⁸. Ten key habitat criteria are assessed for the calculation, including:

1. Geographic location;
2. Pond area;
3. Pond permanence;
4. Water quality;
5. Pond shading;
6. Number of waterfowl;

³ CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal and Marine. Chartered Institute for Ecology and Environmental Management, Winchester.

⁴ CIEEM (2021) Good Practice Guidance for Habitats and Species; Version 3.

⁵ Scottish Badgers (2018). Surveying for Badgers: Good Practice Guidelines. Version 1.

⁶ Badger Trust (2023). Badger Protection: Best Practice Guidance for Developers, Ecologists and Planners (Wales).

⁷ Andrews R. (2013). The classification of badger *Meles meles* setts in the UK: A review and Guidance for surveyors. In Practice [82] 27- 31. Winchester: Chartered Institute of Ecology and Environmental Management (CIEEM).

⁸ Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000). Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). Herpetological Journal, 10: 143-155.

7. Occurrence of fish;
8. Pond density;
9. Terrestrial habitat quality; and
10. Macrophyte content.

2.12 Each habitat criteria is assigned a value between 0 (highly unsuitable) and 1 (highly suitable). The geometric mean of these values provides an overall suitability score for the waterbody using the following equation: $HSI = (SI1 \times SI2 \times SI3 \times SI4 \times SI5 \times SI6 \times SI7 \times SI8 \times SI9 \times SI10) 1/10$. This score is then used to categorise a waterbody's suitability for use by great crested newts as shown below:

- < 0.5 = Poor;
- 0.5–0.59 = Below Average;
- 0.6–0.69 = Average;
- 0.7–0.79 = Good; and
- >0.8 = Excellent.

eDNA Survey

2.13 In 2023, eDNA surveys were undertaken on all waterbodies identified as 'below average' or higher suitability to establish presence/absence of GCN through the presence of their DNA within the water column of each waterbody. Waterbodies with 'poor' suitability were excluded from further survey as the condition would be unsuitable and highly unlikely to support breeding GCN.

2.14 In 2023, 14 waterbodies were subject to eDNA surveys. In addition, pond A62 was subject to eDNA survey in June 2024. In 2025, Pond A2 in the Northern Substation Area was also subject to eDNA. Ponds A4 and A61 in this area were not subject to eDNA as full population size class assessment surveys were already being undertaken.

2.15 The eDNA method⁹ is approved for use during the breeding season only from 15th April to 30th June in any given year. Samples were taken as per the Surescreen Scientifics guidelines included with the sample kits:

- While wearing gloves, 50ml of pond water is collected from a pond, using a plastic ladle, and emptied into a whirl-pack bag.
- The whirl-pack bag is closed securely and the water shaken to mix any DNA across the whole water sample;

- A new pair of gloves is used for each sample to reduce the risk of cross-contamination.
- Using a clear plastic pipette, 15ml of water from the whirl-pack bag is then taken and added to one of the six conical tubes with preserving fluid;
- The tube is then closed using the cap provided and the tube is shaken for 10 seconds to mix the sample and the preservative;
- The process is then repeated for each of the six conical tubes in the kit; and
- For each pond, the samples are labelled and grid referenced. A pond habitat survey is also conducted to indicate vegetation cover and time of sampling.

2.16 Each waterbody was sampled at 20 locations, taken equidistant around the circumference of the waterbody, where accessible. The samples from each waterbody were then sent to be analysed by a suitably equipped laboratory (Surescreen Scientifics).

Population Size Class Assessment

2.17 GCN populations assessments were carried out in 2023 on ponds that tested positive for eDNA and were located within 250m of a proposed met mast location. In 2025, population assessments were undertaken on Ponds A4 and A61, testing positive for eDNA, within the Northern Substation Area.

2.18 In accordance with industry standard guidelines¹⁰, the ponds were subject to six survey visits, each comprising an evening and morning visit, with three surveys being undertaken in the optimum period. Three possible methods of searching (bottle trapping, netting, torching, refugia searching and egg searching) were employed on each survey visit following best practice guidance. The survey methods used are described below:

- Bottle Trapping - Bottle traps are an effective way of detecting and assessing a population. The traps, assembled from bamboo canes and plastic bottles, are placed at 2m intervals along the banks of the waterbody near suitable newt egg laying habitat where macrophytes or leaf litter are present, where accessible. The traps should be positioned to allow a bubble of air to be maintained with the bottle. Bottle traps were set up in

⁹ Biggs J. et al (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. Oxford: Freshwater Habitats Trust.

¹⁰ English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature, Peterborough

the evening and collected the following morning, within 12 hours of the trap being set.

- Torchlight Search - A search for great crested newts was made by walking slowly around the entire accessible perimeter of each pond. This was done at least 30 minutes after sunset using a 1,000,000 candlepower torch.
- Netting - Netting is carried out by sweeping a sturdy dip-net with a 2-4 mm mesh through the water of the pond in a figure of 8 motion. This is done around the perimeter of the pond for a period of 15 minutes per 50 m of pond shoreline.
- Egg Searches – A search of GCN eggs within folded leaves in marginal vegetation was also undertaken on each survey to identify breeding.

2.19 Natural England (2001) (previously 'English Nature') guidance¹⁰ is then used to calculate the population size of GCN as they were recorded in each pond surveyed. This is established by the peak count of adult GCN for any single survey technique used. Where there is reasonable certainty that there is regular interchange of animals between ponds (typically, within 250m and with an absence of barriers to dispersal), counts obtained on the same visit can be summed across ponds. Populations are determined as follows:

- 'Small' for maximum counts of up to 10;
- 'Medium' for maximum counts between 11 and 100; and
- 'Large' for maximum counts over 100.

Otter

2.20 An otter survey was undertaken on all watercourses located within the ESA, including the Access Road Area and the Substation Area, in accordance with recognised best practice^{11,12}. Ecologists searched for evidence of suitable habitat for, and direct evidence of, otter. Watercourses were categorised into four suitability classifications based on a variety of characteristics including wet width, water depth, suitable foraging resources, suitable resting sites, and connectivity to suitable habitats. Descriptions of suitability categories are provided in **Table 2.2** below.

Table 2.2 Watercourse Suitability for Otter

Suitability	Description
Optimal	Typically larger, main watercourses (at least 1m in wet width). These watercourses contain

Suitability	Description
	flow at all times of year (not just in spate) and will support foraging resources (such as amphibians and fish). Rocky banksides or vegetation overhangs will provide suitable resting places, and large boulders will provide ideal sprainting sites.
Sub-optimal	Generally a substantial watercourse, greater than 0.5m in width. These watercourses will comprise stone and rock substrate, with occasional boulders. There may be limited resting opportunities, however, vegetation overhangs and occasional rocky crevices may be present.
Suitable	These watercourses may be sporadically used by otter, with connectivity to optimal or sub-optimal watercourses. The watercourses themselves will typically be no wider than 0.5m, with a relatively shallow flow of water. Substrate may comprise stone and earth, and banksides may comprise grassland.
Unsuitable	Generally will be a narrow channel, which may contain very little water. The channel may be very densely vegetated with limited suitability to support otter foraging resources.

2.21 Where watercourses were considered suitable to support otter, a detailed survey was undertaken for field signs, including:

- Resting sites (as defined in **Table 2.3**);
- Spraint (including age and description: fresh, recent, old);
- Prints, tracks, slides and runs; and
- Feeding remains.

Table 2.3 Otter Resting Site Classifications

Resting Site Type	Description
Natal Holt	A discreet holt site that is used by a bitch to birth cubs, where they will normally remain for up to three months, before being moved to a secondary holt. These sites are seldom located during surveys and they are rarely recorded without the aid of camera traps. It is generally accepted that most natal holts will

¹¹ Chanin, P. (2003). Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No.10. English Nature, Peterborough.

¹² NatureScot (2016). Protected Species Advice for Developers: Otters [Online]. Available at: <https://www.nature.scot/sites/default/files/2018-09/Species%20Planning%20Advice%20-%20Otter.pdf>. [Accessed March 2022].

Resting Site Type	Description
	contain bedding material and sprainting activity is minimal whilst occupied.
Holt	A cavity or hole on or adjacent to a watercourse. It may be in the ground, under tree roots, within rocks or caves; where it cannot be readily observed. If a holt is confirmed as active it usually contains field evidence such as spraint.
Hover	A bolt hole or ledge that provides temporary cover or a place to eat prey. It is not fully enclosed, and the back of the feature can normally be observed. There may be spraints, footprints and feeding evidence present.
Couch	An above-ground shelter normally used for lying-up and grooming. They may take the form of a depression in tall vegetation or may be covered in a vegetated grass 'roof'.
Breeding Site	An area of land in which otters breed. The site may be large, and it is usually more important to protect this site than an individual natal holt.

2.22 The otter surveys were corroborated by the presence or lack of field evidence located in, or around features within the ESA. Diagnostic evidence (such as spraints, urination "green" spots, spraint mounds, sign heaps, grooming hollows, footprints, paths, and slides) where identified was used to interpret if a resting site was present.

2.23 Where spraint was recorded, it was allocated an age class in accordance with the following descriptions:

- **Fresh:** The spraint is still very moist and pungent, and was likely to have been deposited within the last few hours or days.
- **Recent:** The spraint has become decayed but retains consistency and some odour. It is dry and colour is more faded. It is likely to have been deposited within the last week or two.
- **Old:** The spraint is desiccated and powdery having lost its shape and most odours. Usually remains are still evident and identifiable, usually by the abundance of fish-bone or scales. It is likely to have been deposited approximately a month ago (sometimes longer).

Water Vole

2.24 Signs of water vole were searched for during the otter survey (as well as during the habitat and NVC surveys). Ecologists searched for evidence of suitable habitat for, and direct evidence of, water vole in accordance with recognised best practice¹³. Surveyors also checked upland habitats for water vole given recent records of the species in upland wetland habitats in South Wales.

2.25 Field signs searched for included:

- Burrows and tunnel systems;
- Runs, tracks and slides;
- Latrines (with droppings categorised as fresh, recent, or old);
- Feeding stations and remains; and
- Physical sightings.

Other species

2.26 While surveys for other species were not specifically undertaken, incidental observations of other species were recorded, particularly where legislation protections were relevant. For example, ad-hoc sightings of amphibians were noted on GIS-enabled field tablets.

Constraints and Limitations

2.27 All ecological surveys represent a snapshot of the faunal and floral assemblages of any given site¹⁴. While surveys provide an overview of the habitats and species present, they cannot be used to determine long-term trends in species and habitat populations or behaviours. Methods adopted within the ESA at the Site represent current good practice but the data collected cannot be used to confirm the indefinite absence of a species from the ESA. Faunal and floral assemblages are dynamic and can change over short periods of time. To that end, the ESA's suitability to support protected species is considered, in addition to direct searches for evidence.

2.28 Much of the site is covered in dense bracken, which limited the surveyor's ability to search for evidence of badger. This limitation is commonly encountered during badger surveys and the lack of recorded badger field signs should be interpreted with caution. This bracken is harvested each year by the farmers for livestock bedding and this annual disturbance reduces the likelihood of badger setts being present.

¹³ Strachan, R., Moorhouse, T. and Gelling, M. (2011). Water Vole Conservation Handbook. Third Edition. Wildlife Conservation Research Unit, Oxford.

¹⁴ CIEEM (2019). Advice Note: On the Lifespan of Ecological Reports and Surveys. Winchester: Chartered Institute for Ecology and Environmental Management.

2.29 The GCN population size class assessment did not commence until 15th May 2023 and so the majority of surveys were completed outside of the mid-April to mid-May key survey window¹⁰. The following paragraph explains why this is not considered to be a significant constraint to the assessment.

2.30 Weather data and temperature recordings (time and date, 2023) indicate that air temperatures in March and April 2023 from Builth Wells recorded lows of below 5°C throughout the majority of these months. With consistent low temperatures, newts can be so inactive in ponds that they go undetected. The air temperature below which torching becomes less reliable has not been established but 5°C can be taken as a working guide¹⁵. It is considered that due to the poor weather in Spring 2023, GCN breeding is less likely to have occurred early in the season due to potential low activity in cooler conditions. It is therefore considered that the later start to the population assessment from mid-May is unlikely to present a significant constraint to the assessment, as it is considered that the majority of breeding adults would still have been present within ponds at this time due to the likely later start to the breeding season.

¹⁵ Citation - Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), Great Crested Newt Conservation

Handbook, Froglife, Halesworth

Chapter 3

Results

Baseline

Desk Study

3.1 The 2020 data search found historical records of otter and badger within 2km of the Site (see **Appendix 7.1**). Otter was recorded within 70m to the west of the Site. Badger was recorded on Site.

3.2 Common species of reptile were recorded around 2.5km from the Site and GCN within 800m. There were no records of water vole or hazel dormouse.

3.3 The updated 2025 data search included off-site records for brown hare *Lepus europaeus*, hedgehog *Erinaceus europaeus*, otter, pine marten *Martes martes*, badger, great crested newt, wall butterfly *Lasiommata megera*, small blue *Cupido minimus*, violet oil beetle *Meloe violaceus* and black oil beetle *Meloe proscarabaeus*. There were on Site records of small heath butterfly *Coenonympha pamphilus* and smooth newt *Lissotriton vulgaris*

Field Survey

Habitats Overview

3.4 The Site consists of an essentially upland landscape with steep sided valleys on the periphery, resulting in a variety of vegetation communities and habitats, such as heathland, acid grassland and bracken. For more detailed descriptions of the habitats present within the Site, see **Appendix 7.2**.

Badger

3.5 Much of the Site provides unsuitable habitat for badger being exposed upland with expanses of bracken, acid grassland and heathland. Where the edges of the Site include farmland, woodland, hedges or wooded valleys, and less exposed low lying parts of the hill, these are more suitable for badger.

3.6 Records of badger activity include roadkill (2019) from 1km square on the north-eastern edge of the Site (east of T17), 1km square off site east of T15 (roadkill 2019), in 1km square south of T8 (2003) and 1km square off site south of T19 (2003), all recorded by Radnorshire Badger Group.

3.7 The Oct 2023 badger survey of the Site detected potential badger rooting field signs in multiple path areas. One potential badger footprint was identified within soil that was uprooted in the north of the Site. A single main badger sett was recorded during the May 2025 survey of the Southern Fields Area. This was in woodland over 500m from any works associated with the Proposed Development. No other badger setts were detected.

3.8 The habitats around the Access Road Area and Northern Substation Area comprised woodland, scattered bracken, and improved grassland which provided suitable foraging and sheltering habitat for badgers. Suitable habitats for badger within the adjacent and wider landscape were also present. One badger footprint was identified during the extended Phase 1 Habitat Survey of the Access Road Area. No evidence of sett building, or other badger activity, was noted during the surveys. The Northern Substation Area

contained one disused badger sett which showed evidence of being taken over and used by foxes.

Great Crested Newt

3.9 Several records for GCN *Triturus cristatus* are present in the wider landscape. The ITP 2023 Survey found positive GCN eDNA in 6 ponds within the Site (see Table 3.1 below).

3.10 The Site is mostly upland heathland and acid grassland, with areas of bracken and gorse, all of which offer suitable terrestrial habitat for GCN.

3.11 The results of the Habitat Suitability Index (HSI), eDNA and population surveys of the ponds on Site are set out in **Table 3.1** below and the locations of the ponds and survey results are shown in **Figure 7.4**. The full details of the HSI survey are found in **Annex A**.

Table 3.1 Habitat Suitability Index (HSI) and eDNA results

Pond Number	Grid ref	Survey results	GCN population
A1	SO 07989 53278	No access: outside of Site to the North	N/a
A2	SO 08189 53118	2023 HSI average 2023 eDNA negative 2025 eDNA negative	
A3	SO 08995 53077	No access: outside of Site to the North	N/a
A4	SO 08569 53046	2023 HSI below average 2023 eDNA positive 2025 Population Survey	Small Peak count 2
A5	SO 09953 53549	No access: outside of Site to the North	N/a
A6	SO 09981 53204	No access: outside of Site to the North	N/a
A7	SO 10594 52555	2023 HSI below average 2023 eDNA positive 2023 Population survey	Small Peak count 2
A8	SO 10703 52488	2023 HSI poor	Assumed absent
A9	SO 11261 52534	2023 HSI poor 2024 sight record	Assumed small
A10	SO 11110 50860	2023 HSI poor	Assumed absent
A11	SO 09984 49564	2023 HSI below average 2023 eDNA positive	Assumed small

Pond Number	Grid ref	Survey results	GCN population
A12	SO 09061 50094	2023 HSI poor	Assumed absent
A13	SO 07929 49749	2023 HSI good 2023 eDNA negative	Assumed absent
A14	SO 07993 50003	2023 HSI good 2023 eDNA positive	Assumed small
A15	SO 08119 50216	2023 HSI poor	Assumed absent
A16	SO 08554 50322	2023 HSI average 2023 eDNA positive 2023 Population Survey	Small Peak count 3
A17	SO 08614 50548	2023 HSI good 2023 eDNA negative	Assumed absent
A18	SO 08673 50600	2023 HSI poor	Assumed absent
A19	SO 08473 50595	2023 HSI poor	Assumed absent
A20	SO 08466 50647	2023 HSI poor	Assumed absent
A21	SO 08478 50684	2023 HSI poor	Assumed absent
A22	SO 08544 50694	2023 HSI poor	Assumed absent
A23	SO 08647 50837	2023 HSI poor	Assumed absent
A24	SO 08619 50922	2023 HSI poor	Assumed absent
A25	SO 08465 50931	2023 HSI poor	Assumed absent
A26	SO 08357 51476	2023 HSI poor	Assumed absent
A27	SO 08292 51489	2023 HSI poor	Assumed absent
A28	SO 08344 51500	2023 HSI poor	Assumed absent
A29	SO 08419 51529	2023 HSI poor	Assumed absent
A30	SO 08251 51562	2023 HSI poor	Assumed absent
A31	SO 08281 51589	2023 HSI poor	Assumed absent
A32	SO 08322 51618	2023 HSI poor	Assumed absent

Pond Number	Grid ref	Survey results	GCN population
A33	Dried up, absent.		
A34	SO 08025 51741	2023 HSI below average 2023 eDNA negative	Assumed absent
A35	SO 07981 51840	2023 HSI poor	Assumed absent
A36	SO 08224 52203	2023 HSI poor	Assumed absent
A37	SO 08279 52328	2023 HSI average 2023 eDNA negative	Assumed absent
A38	SO 08359 52334	2023 HSI poor	Assumed absent
A39	SO 08884 52365	2023 HSI poor	Assumed absent
A40	SO 09045 52375	2023 HSI poor	Assumed absent
A41	SO 09525 52494	2023 HSI poor	Assumed absent
A42	SO 09604 52112	2023 HSI poor	Assumed absent
A43	SO 09520 52032	2023 HSI poor	Assumed absent
A44	SO 09648 52031	2023 HSI below average 2023 eDNA negative	Assumed absent
A45	Dried up, absent		
A46	SO 09659 52045	2023 HSI poor	Assumed absent
A47	SO 09613 52019	2023 HSI poor	Assumed absent
A48	SO 09627 52046	2023 HSI poor	Assumed absent
A49	SO 09680 52026	2023 HSI below average 2023 eDNA negative	Assumed absent
A50	SO 09844 51867	2023 HSI poor	Assumed absent
A51	SO 10016 51741	2023 HSI poor	Assumed absent
A52	SO 10063 51723	2023 HSI poor	Assumed absent
A53	SO 10022 51676	2023 HSI poor	Assumed absent

Pond Number	Grid ref	Survey results	GCN population
A54	SO 10068 51675	2023 HSI poor	Assumed absent
A55	SO 10089 51444	2023 HSI below average 2023 eDNA negative	Assumed absent
A56	SO 10083 51347	2023 HSI good 2023 eDNA positive	Not subject to full population surveys due to H&S. Assumed small
A57	SO 10021 51204	No access: outside of Site to S	N/a
A58	SO 10986 52655	2023 HSI poor	Assumed absent
A59	SO 10984 52608	2023 HSI poor	Assumed absent
A60	SO 10998 52540	2023 HSI poor	Assumed absent
A61	SO 08512 53278	2025 HSI 2025 Population Survey	Small Peak count 2
A62	SO 11652 52966	2024 HSI poor 2024 eDNA negative	Assumed absent

3.12 Population surveys found a small population of GCN to be present in ponds A4, A7, A16 and A61. Ponds A4 and A61 are considered to support a regular interchange of animals and therefore have a summed peak population of 4 GCN (small population).

3.13 In addition, there was a sight record of GCN in pond A9 which is assumed to have a small population. Pond A56 tested positive for GCN eDNA but was not subject to population surveys, due to health and safety restrictions, but is

assumed to have a small population of GCN present, based on the site conditions and results of all of the other population surveys. Ponds A11 and A14 tested positive for GCN eDNA and are also assumed to have a small population of GCN present, however, these ponds are located over 460m and 600m respectively from the Proposed Development.

3.14 The distances of these ponds from any part of the Proposed Development are set out below:

Table 3.2 Pond distances from the Proposed Development

Pond	Distance to works	Notes
A4	50m to cable route. 275 m to substation	Cable route located in sub optimal improved grassland.
A7	60m to access track. 140m to turbine foot earthworks. 180m to hardstanding for T14.	
A9	50m from earthworks for Borrow Pit A. 95m from earthworks for T17. 110m from hardstanding for T17.	
A11	460m to south of hardstanding for T7.	Intervening habitat unsuitable for GCN (open moorland). Closer terrestrial habitat of woodland and bracken hillside 100m to west. No impact predicted.

A14	600m to south west of any works (closest is hardstanding of T2).	No impact predicted.
A16	55m to south of access track running between T1 and T2. 95m from earthworks for T2 and 100m from hardstanding of T2.	
A56	115m from access track between T10 and T9. 140m from hardstanding of T9.	
A61	0m	Pond to be lost

Otter

3.15 Surveys identified only limited suitable habitat for otter. The few minor watercourses within the upland areas on Site are shallow, steep and narrow and do not offer suitable conditions for otter sheltering, commuting, and foraging.

3.16 There is a small stream that runs northwest to southeast near the centre of the Access Road Area. The stream has limited tree and scrub cover, other than margins which are dominated by soft rush, and the water was clear and fast flowing at the time of survey. This stream could provide suitable habitat for commuting otter but no evidence of otter was found.

3.17 No evidence of otter was found during the survey for the Substation Area. The streams in this area are shallow and also have very little marginal vegetation. The majority of the streams are bordered by heavily grazed grassland fields and lack suitable sheltering opportunities.

3.18 No evidence of otter was found during any of the otter surveys on Site.

Species Scoped Out of the ES

Water Vole

3.19 The Proposed Development area provides very limited suitable habitat for water vole. None of the minor watercourses provide suitable habitat, as these lack suitable earth banks with access to sufficient water and sheltering habitat. The top of Aberedw Hill supports some pools, bog and marshy grassland habitats, but these have limited cover for this species and are not connected to suitable watercourses.

3.20 The small stream that runs northwest to southeast near the centre of the Access Road Area has narrow margins, which are dominated by soft rush, and the water was clear and fast flowing at the time of survey. The banks have limited suitability for water vole, and contain little marginal vegetation other than soft rush. No evidence of water vole was found around this stream.

3.21 No potential or evidence was found of water vole during survey of the Northern Substation Area. No evidence of water vole was found on Site during the surveys.

Dormouse

3.22 The October 2023 survey for protected species potential did not identify suitable habitats for hazel dormouse, therefore these were scoped out. However, the March 2025 extended Phase 1 Habitat Surveys of the Substation Area identified a small amount of potentially suitable woodland and hedgerow habitat for dormouse. A hedgerow along the Access Road Area also provides suitable habitat for dormouse, however, this hedgerow is poorly connected to the surrounding hedgerow network, due to connecting defunct hedgerows and tree lines with poorly connected canopies. Therefore, dormouse presence is considered unlikely.

Reptiles

3.23 The Site comprised large areas of bracken, acid grassland, heathland, gorse and marshy areas, with some farmland areas in the north and north-west along the access road and some woodlands around the Site peripheries. The habitats were suitable for common reptile species such as common lizard *Zootoca vivipara*, slow worm *Anguis fragilis*, adder *Vipera berus* and grass snake *Natrix Helvetica* (more likely within the lowland ponds than within the vicinity of the upland areas).

3.24 Detailed surveys were not undertaken, though one common lizard was identified within heathland habitat in the north-west of the Site. Suitable habitat is widespread across the Site, providing ample opportunities for reptiles to disperse away from any proposed works, without overall loss of habitat carrying capacity for reptiles.

White Clawed Crayfish

3.25 The minor streams within the valleys on the steep slopes of Aberedw Hill were not considered suitable for white clawed crayfish, due to the narrow channels, steep slopes, fast moving water and limited refuges. The minor stream south of

the Access Road Area and the streams within the northern Substation Area were also considered unsuitable for this species, being shallow, drying in summer, and with limited refuges. The surrounding habitat of improved and poor semi-improved grassland reduced the water quality.

Fish

3.26 For similar reasons, the habitat surveys did not identify the watercourses as being suitable for fish and the watercourses have limited connectivity to other watercourses in the surrounding landscape, due to the presence of culverts and steep slopes.

Fairy Shrimp

3.27 There is a record of fairy shrimp *Chirocephalus diaphanous* from the ephemeral ponds on Site, specifically the area of the pond cluster A26-A32 (grid ref SO083515, from 2006, Welsh Invertebrate Database).

3.28 As no upland ponds are being lost or impacted by the proposed works, surveys for this species were not undertaken. Only Pond A61 is to be lost to facilitate the Proposed Development, and this pond is considered unlikely to support fairy shrimp, due to being permanent, with poor water quality, high nutrient levels and being densely overgrown by bulrush.

3.29 The butterfly small heath was recorded on Site in 2021: this is a Welsh Species of Principal Importance and is widespread on grassland, acid grassland and heathland habitats.

3.30 The 2020 data search and 2025 updated data search did not identify any other important invertebrate records or populations for the Site.

Annex A

GCN Survey Data

GCN HSI scores and population survey results

Table A.1: HSI scores (2023)

Pond ID	Pond area	Size	Permanence	Water quality	Shade	Waterfowl	Fish	Pond count	Terrestrial Habitat	Macrophytes	HSI Score	HSI Result
2	0.5	0.97	0.9	0.33	1	0.67	0.33	0.64	0.67	0.45	0.60	Average
4	0.5	0.1	0.5	0.67	1	1	1	0.68	0.33	0.4	0.52	Below average
6	0.5	0.1	0.9	1	1	0.67	0.67	0.38	0.33	0.5	0.51	Below average
7	0.5	0.4	0.5	1	1	0.67	1	0.53	0.33	0.35	0.58	Below average
8	0.5	0.4	0.1	1	1	0.67	1	0.53	0.33	0.35	0.49	Poor
9	0.5	0.1	0.1	1	1	0.67	1	0.58	0.33	0.5	0.45	Poor
10	0.5	0.1	0.5	1	1	0.67	1	0.1	0.33	0.75	0.46	Poor
11	0.5	0.6	0.5	1	1	0.67	1	0.27	0.33	0.6	0.59	Below average
12	0.5	0.1	0.1	0.67	1	0.67	1	0.61	0.01	0.4	0.30	Poor
13	0.5	0.99	1	1	1	1	1	0.82	0.33	0.4	0.75	Good
14	0.5	1	0.5	1	1	1	1	1	0.33	0.35	0.70	Good
15	0.5	0.05	0.1	1	1	1	1	1	0.33	0.3	0.44	Poor
16	0.5	0.4	0.5	1	1	1	1	1	0.33	0.6	0.68	Average
17	0.5	0.86	0.9	1	1	1	0.67	1	0.33	0.55	0.74	Good
18	0.5	0.1	0.1	0.67	1	1	1	1	0.33	0.35	0.46	Poor
19	0.5	0.05	0.1	1	1	1	1	1	0.67	0.35	0.48	Poor
20	0.5	0.05	0.1	1	1	1	1	1	0.67	0.45	0.49	Poor
21	0.5	0.05	0.1	1	1	1	1	1	0.67	0.4	0.48	Poor

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22	0.5	0.1	0.1	1	1	1	1	1	0.33	0.4	0.48	Poor
23	0.5	0.05	0.1	0.01	1	1	1	1	0.01	0.3	0.19	Poor
24	0.5	0.05	0.1	1	1	1	1	1	0.33	0.3	0.44	Poor
25	0.5	0.1	0.1	1	1	1	1	1	0.33	0.35	0.47	Poor
26	0.5	0.05	0.1	1	1	0.67	1	0.68	0.33	0.3	0.40	Poor
27	0.5	0.05	0.1	1	1	0.67	1	0.68	0.33	0.4	0.41	Poor
28	0.5	0.05	0.1	1	1	0.67	1	0.61	0.33	0.35	0.40	Poor
29	0.5	0.05	0.1	0.01	1	0.67	1	0.68	0.33	0.3	0.25	Poor
30	0.5	0.05	0.1	0.01	1	0.67	1	0.68	0.01	0.3	0.18	Poor
31	0.5	0.05	0.1	0.01	1	0.67	1	0.68	0.01	0.3	0.18	Poor
32	0.5	0.1	0.1	1	1	0.67	1	0.68	0.33	0.45	0.45	Poor
34	0.5	0.6	0.1	1	1	0.67	1	0.95	0.33	0.4	0.55	Below average
35	0.5	0.05	0.1	1	1	0.67	1	0.95	0.33	0.6	0.45	Poor
36	0.5	0.1	0.1	1	1	1	1	1	0.33	0.3	0.47	Poor
37	0.5	1	0.5	1	1	1	1	1	0.33	0.3	0.69	Average
38	0.5	0.05	0.1	1	1	1	1	1	0.33	0.3	0.44	Poor
39	0.5	0.05	0.1	1	1	1	1	1	0.33	0.3	0.44	Poor
40	0.5	0.1	0.1	1	1	0.67	1	1	0.33	0.3	0.45	Poor
41	0.5	0.05	0.1	0.01	1	1	1	1	0.33	0.3	0.28	Poor
42	0.5	0.05	0.1	0.01	1	1	1	1	0.33	0.3	0.28	Poor
43	0.5	0.1	0.1	1	1	1	1	1	0.33	0.35	0.47	Poor
44	0.5	0.1	0.1	1	1	1	1	1	0.67	0.55	0.53	Below average

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46	0.5	0.05	0.1	0.67	1	1	1	1	0.67	0.7	0.49	Poor
47	0.5	0.05	0.1	0.67	1	1	1	1	0.67	0.55	0.48	Poor
48	0.5	0.05	0.1	0.67	1	1	1	1	0.67	0.45	0.47	Poor
49	0.5	0.4	0.1	0.67	1	1	1	1	0.67	0.5	0.58	Below average
50	0.5	0.1	0.1	0.67	1	1	1	1	0.67	0.4	0.50	Poor
51	0.5	0.05	0.1	1	1	1	1	1	0.67	0.4	0.48	Poor
52	0.5	0.05	0.1	0.67	1	1	1	1	0.67	0.3	0.45	Poor
53	0.5	0.1	0.1	1	1	1	1	1	0.33	0.35	0.47	Poor
54	0.5	0.1	0.1	0.67	1	1	1	1	0.33	0.4	0.46	Poor
55	0.5	0.4	0.1	1	1	1	1	1	0.33	0.5	0.53	Below average
56	0.5	1	1	1	1	1	0.67	1	0.33	0.4	0.73	Good
58	0.5	0.05	0.1	1	1	0.67	1	0.68	0.33	0.7	0.44	Poor
59	0.5	0.05	0.1	0.67	1	0.67	1	0.68	0.33	0.7	0.42	Poor
60	0.5	0.1	0.1	1	1	0.67	1	0.68	0.33	0.45	0.45	Poor
61	0.5	0.2	0.5	0.67	1	0.67	1	1	0.33	0.9	0.61	Average
62	0.5	0.2	0.9	0.67	0.4	0.01	0.67	0.1	1	0.9	0.33	Poor

Table A.2: Population survey results

Date	Weather	Survey type	Air temperature °C	GCN male	GCN female
A4					
15.04.25	Dry, following showers	Torch	6	2	0

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Date	Weather	Survey type	Air temperature °C	GCN male	GCN female
16.04.25	Dry and overcast	Egg search	6	0	0
		Bottle trapping		0	1
16.04.25	Clear and dry	Torch	5	0	0
17.04.25	Dry and sunny	Egg search	9	0	0
		Bottle trapping		0	0
22.04.25	Moderate rain	Torch	10	Not undertaken due to rain	
23.04.25	Dry and overcast	Egg search	11	0	0
		Bottle trapping		0	0
22.05.25	Clear and dry	Torch	9	0	0
23.05.25	Dry and overcast	Egg search	15	0	0
		Bottle trapping		0	1
28.05.25	Clear and dry	Torch	14	0	0
29.05.25	Dry and sunny	Egg search	18	0	0
		Bottle trapping		0	0
04.06.25	Dry and overcast. Light breeze	Torch	16	0	0
06.06.25	Cloud with light drizzle	Egg search	12	0	0
		Bottle trapping		0	0
A61					

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Date	Weather	Survey type	Air temperature °C	GCN male	GCN female
15.04.25	Dry, following showers	Torch	6	0	0
16.04.25	Dry and overcast	Egg search	6	0	0
		Bottle trapping		0	0
16.04.25	Clear and dry	Torch	5		0
17.04.25	Dry and sunny	Egg search	9	0	0
		Bottle trapping		2	0
22.04.25	Moderate rain	Torch	10	0	0
23.04.25	Dry and overcast	Egg search	11		0
		Bottle trapping		0	0
22.05.25	Clear and dry	Torch	9	0	0
23.05.25	Dry and overcast	Egg search	15	0	0
		Bottle trapping		0	0
28.05.25	Clear and dry	Torch	14	0	0
29.05.25	Dry and sunny	Egg search	18	0	0
		Bottle trapping		0	0
04.06.25	Dry and overcast. Light breeze	Torch	16	0	0
06.06.25	Cloud with light drizzle	Egg search	12	0	0
		Bottle trapping		0	0

Date	Weather	Survey type	Air temperature °C	GCN male	GCN female
A7					
15.05.23	Dry, light breeze	Torch	11	0	1
		Egg search		0	0
		Netting		0	0
16.05.23	Dry, light breeze	Bottle	12	0	0
20.05.23	Dry, light breeze	Torch	12	0	2
		Egg search		0	0
		Netting		0	0
21.05.23	Dry, light breeze	Bottle	12	0	0
23.05.23	Dry, moderate breeze	Torch	12	0	0
		Egg search		0	0
		Netting		0	0
24.05.23	Dry, light breeze	Bottle	14.6	0	0
26.05.23	Dry, light breeze	Torch	13	0	0
		Egg search		0	0
		Netting		0	0
27.05.23	Dry, light breeze	Bottle	15.4	0	0
30.05.23	Dry, light breeze	Torch	17.4	0	0

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Date	Weather	Survey type	Air temperature °C	GCN male	GCN female
		Egg search		0	0
		Netting		0	0
31.05.23	Dry, moderate breeze	Bottle	16.2	0	0
02.06.23	Dry, light breeze	Torch	19	0	0
		Egg search		0	0
		Netting		0	0
03.06.23	Dry, light breeze	Bottle	13	0	0
A16					
15.05.23	Dry, light breeze	Torch	11	0	1
		Egg search		0	0
		Netting		0	0
16.05.23	Dry, light breeze	Bottle	12	1	1
20.05.23	Dry, light breeze	Torch	12	0	
		Egg search		0	0
		Netting		0	0
21.05.23	Dry, light breeze	Bottle	12	0	1
23.05.23	Dry, moderate breeze	Torch	12	0	0
		Egg search		0	0

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Date	Weather	Survey type	Air temperature °C	GCN male	GCN female
		Netting		0	0
24.05.23	Dry, light breeze	Bottle	14.2	0	1
26.05.23	Dry, light breeze	Torch	13.5	0	0
		Egg search		0	0
		Netting		0	0
27.05.23	Dry, light breeze	Bottle	15.1	0	1
30.05.23	Dry, light breeze	Torch	17	0	0
		Egg search		0	0
		Netting		0	0
31.05.23	Dry, moderate breeze	Bottle	17.5	1	1
02.06.23	Dry, light breeze	Torch	19	0	0
		Egg search		0	0
		Netting		0	0
03.06.23	Dry, light breeze	Bottle	19.9	2	1