Yorkshire Water Solar Array: Wombwell WWTW

Ecological Impact Assessment

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ACRONYMS AND ABBREVIATIONS

Acronym	Description
BMBC	Barnsley Metropolitan Borough Council
BS	British Standard
CCTV	Closed-circuit Television
CIEEM	Chartered Institute of Ecology and Environmental Management
CoLD	Certificate of Lawful Development
DBW	Daytime Bat Walkover
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Work
EIA	Environmental Impact Assessment
ESA	Ecology Survey Area
EPS	European Protected Species
GCN	Great Crested Newt
GLTA	Ground Level Tree Assessment
ha	Hectares
HPI	Habitats of Principal Importance
JNCC	Joint Nature Conservation Committee
km	Kilometers
LNR	Local Nature Reserve
LWS	Local Wildlife Site
m	Metres
MAGIC	Multi-Agency Geographic Information for the Countryside
NNR	National Nature Reserve
OS	Ordnance Survey
PV	Photovoltaic
NGR	National Grid Reference
PEA	Preliminary Ecological Appraisal
PRA	Preliminary Roost Assessment
PRF	Potential Roost Feature
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
WWTW	Wastewater Treatment Works

1. INTRODUCTION

Environmental Resources Management Limited (ERM) was commissioned by Downing Energy Development Company Limited (the Applicant) to complete an Ecological Impact Assessment (EcIA) in connection with a proposed ground mounted solar photovoltaic (PV) system (the Proposed Development) within land at Wombwell Wastewater Treatment Works (WWTW), Ings Road, Wombwell, near Barnsley (the Site).

This EcIA report has been completed in accordance with current professional guidance[1] and details the approach and methods to describe potentially significant effects that could arise from the Proposed Development; as well as (i) recommendations to avoid, mitigate and compensate potentially significant effects, and (ii) opportunities for biodiversity enhancement.

This EcIA report is provided in support of an application to Barnsley Metropolitan Borough Council to obtain a Certificate of Lawful Development (CoLD) for the Proposed Development.

1.1 SITE DESCRIPTION

The Site comprises 1.2 ha portion of land at Yorkshire Water's Wombwell WWTW, within an area that has been in operational use since Yorkshire Water acquired the land by a conveyance dated December 1976.

The Site is located at Ordnance Survey National Grid Reference (OS NGR) SE 40979 03433 (Bulling Dike); as shown on **Figure 1, Appendix A**. The Site is not accessible to the public, and is under sole control of the Applicant, with access to the Site managed through locked gates from Ings Road and through the treatment works.

Based on a review of aerial imagery and mapping, the Site primarily supports open grassland and access tracks through Wombwell WWTW. The Site crosses the Bulling Dike, where an existing access track and bridge pass over a watercourse characterised by a narrow channel of deep water with marginal and bankside vegetation dominated by tall grasses. The Site is bounded by an arable field to the east; and further scrub, trees, and open grassland to the south and west.

1.2 PROPOSED DEVELOPMENT

The Applicant is seeking to construct and operate a 370 kilowatt (kW) PV solar array at the Site. The location and layout for the Proposed Development are shown on **Figure 1**, **Appendix A**. The Proposed Development would include a fixed racking solar array with solar-mounted inverters, solar-mounted transformers, CCTV system, palisade fence, access track, grid connection and temporary works area. The power generated by the Proposed Development would be utilised by the Applicant to power the operations of the WWTW. As required, any excess power produced by the Proposed Development will be exported to the grid by the Applicant.

The construction period for the Proposed Development would last approximately 8 – 10 weeks. The Proposed Development would result in temporary traffic increases during the construction period; however, once operational, only periodic routine maintenance will be required. Site access will be gained from the existing WWTW via Ings Road.

[1] CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: terrestrial, Freshwater, Coastal and Marine version 1.3*. Chartered Institute of Ecology and Environmental Management, Winchester.

During the operational phase, the Site will be subject to routine maintenance that will be undertaken by competent site representatives and technicians appointed by the Applicant. The lifetime of the Proposed Development is 25 years, following which the Proposed Development would be decommissioned in line with relevant planning-related requirements.

1.3 PREVIOUS SITE ASSESSMENTS

Previous ecological studies relating to the entirety of the Applicant's landholding at Wombwell, including the Site, were reviewed as part of this assessment:

- Preliminary Ecological Appraisal (PEA) Report[2] undertaken in 2020;
- Badger and Ground Level Tree Roost Assessment (GLTA) Report[3] in 2022, based on the recommendations set out in the 2020 PEA Report; and
- Wombwell Further Ecological Survey Report[4] in 2022, based on the recommendations set out in the 2020 PEA Report.

1.4RELEVANT LEGISLATION AND POLICY

The principal nature conservation legislation that is considered relevant to this assessment includes:

- The Convention on Wetlands of International Importance especially as Waterfowl Habitat (otherwise known as the 'Ramsar Convention')[5];
- Directive 2009/147/EC on the conservation of wild birds (otherwise known as the 'Birds Directive')[6];
- Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (otherwise known as the 'Habitats Directive')[7];
- The Conservation of Habitats and Species Regulations 2017 (as amended in England)[8]
- The Wildlife and Countryside Act 1981 (as amended in England)[9];
- The Environment Act 2021[10];
- The Hedgerows Regulations 1997[11]; and,

[2] BL Ecology (2020) *Solar PV site screening project, site 44 – Wombwell treatment works, preliminary ecological appraisal report.* BL Ecology, Clayton.
[3] RSK (2022) *2483510 – Yorkshire Water Solar Sites – Wombwell – Badger and GLTA Report*. RSK Biocensus, Leeds.
[4] RSK (2022) *Wombwell Treatment Works – Further Ecological Survey Report*. RSK Biocensus, Leeds.
[5] JNCC (2019) The Ramsar Convention [Online] Available at: <Ramsar Convention | JNCC - Adviser to Government on Nature Conservation.> (last accessed May 2025).
[6] The Birds Directive [Online] Available at: <Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.> (last accessed May 2025).
[7] European Commission (1992) Council Directive 92/43/EEC the Conservation of Natural Habitats and of Wild Fauna and Flora. [Online] Available at: <eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN.> (last accessed May 2025).
[8] The Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations 2019 [Online] Available at: <The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.> (last accessed May 2025).
[9] The Wildlife and Countryside Act 1981 (as amended) [Online] Available at: <http://www.legislation.gov.uk/ukpga/1981/69.> (last accessed May 2025).
[10] The Environment Act 2021 [Online] Available at: <Environment Act 2021.> (last accessed May 2025).
[11] The Hedgerow Regulations 1997 [Online] Available at: <The Hedgerows Regulations 1997.> (last accessed May 2025).

- The Natural Environment and Rural Communities (NERC) Act 2006[12].

The principal planning policies relating to biodiversity that are considered relevant to this assessment includes:

- National Planning Policy Framework[13];
- UK Post-2010 Biodiversity Framework[14];
- Barnsley Metropolitan Borough Council Local Plan[15]; and,
- Barnsley Local Biodiversity Action Plan[16].

[12] Natural Environment and Rural Communities (NERC) Act 2006 [Online] Available at: <Natural Environment and Rural Communities Act 2006.> (last accessed May 2025).
[13] Department for Levelling up, Housing and Communities (December 2023) National Planning and Policy Framework [Online] Available at: <National Planning Policy Framework.> (last accessed May 2025).
[14] Four Countries Biodiversity Group (2010) UK Post -2010 Biodiversity Framework [Online] Available at: <UK Post-2010 Biodiversity Framework (jncc.gov.uk).> (last accessed May 2025).
[15] Barnsley Metropolitan Borough Council (2019) Barnsley Local Plan (adopted January 2019) [Online] Available at: <Local Plan.> (last accessed May 2025).
[16] Barnsley Biodiversity Trust (2010). *Barnsley Biodiversity Action Plan*. [Online] Available at: <Barnsley Biodiversity Action Plan.> (last accessed May 2025).

2. METHODOLOGY

The following section details the approach to the assessment, including the desk study, survey areas and methods, and the EcIA.

2.1 DESK STUDY

Natural England's Multi Agency Geographic Information for the Countryside (MAGIC)[17] was consulted in July 2024, and June 2025, to identify the presence of:

- Statutory designated sites within 2 km of the Site including Ramsar sites, Special Areas of Conservation (SAC), Special Protection Areas (SPAs), Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR) (**Figure 2, Appendix A**);
- Non-statutory designated sites within 1 km of the Site including Local Wildlife Sites **(Figure 3, Appendix A**);
- Habitats of Principal Importance (HPI) listed under Section 41 of the Natural Environment and Rural Communities Act 2006 within 500 m of the Site (**Figure 4, Appendix A);**
- Ancient woodlands within 500 m of the Site (**Figure 4, Appendix A)**; and
- European Protected Species (EPS) mitigation licences issued by Natural England within 2 km of the Site.

Records from Barnsley Biological Records Centre (BBRC) were obtained in January 2025 via Yorkshire Water's Service Level Agreement to identify the presence of protected and priority species, as well as other locally important habitats and sites, within 2 km of the Site. Only records of protected and priority species from the last 10 years were included.

Records from the Royal Society for the Protection of Birds (RSPB) were obtained in April 2025 to provide information on the birds in the surrounding area, particularly in relation to the nearby Dearne Valley Wetlands SSSI. This was combined with a desk-based review of habitat suitability and other data sources to inform the assessment for birds, including features of the Dearne Valley Wetlands SSSI.

Aerial imagery and OS mapping was reviewed to identify any potential semi-natural habitats or features that could support protected or priority species, including a specific search to identify waterbodies and watercourses within at least 250 m of the Site.

In addition, reports describing the findings of previous ecological surveys in relation to the Proposed Development were reviewed to identify the presence of protected and priority habitats and species at the Site.

The desk study search areas are shown on **Figures 2-4**, **Appendix A**. For the purpose of this assessment, a 2 km search radius was considered an appropriate Zone of Influence (ZoI) based on the limited scope, scale and complexity of the Proposed Development, prevailing habitats understood to be within and adjoining the Site and professional judgement.

[17] Multi Agency Geographic Information for the Countryside (MAGIC) [Online] Available at: <Magic Map Application.> (last accessed May 2025).

2.2 FIELD SURVEYS

The ZoI of field surveys was determined in accordance with current good practice guidelines; as well as professional judgement based on the nature of potential impacts that could arise from the Proposed Development. All the surveys were led by professional ecologists of at least of capable level experience, based on the Chartered Institute of Ecology and Environmental Management (CIEEM) competency framework.

On the basis that proposed cabling works will be located within appropriately sized ducting affixed to the existing bridge crossing over the Bulling Dike, and limited to areas of maintained grassland within the treatment works, no specific surveys were undertaken within active working areas within treatment works.

2.2.1 HABITATS

A habitat survey of accessible land within and up to 50 m from the Site boundary (hereinafter referred to as the Ecology Survey Area, or ESA) was conducted by ERM Senior Consultant Christina Pullan ACIEEM on 12 September 2024. The ESA is shown in **Figure 5, Appendix A**.

Habitats were classified and mapped in accordance with the latest version of UKHab[18], using relevant alphanumeric codes. A representative photo was also taken of each habitat; as shown in **Appendix C**.

Incidental sightings of any invasive/injurious non-native species of plant encountered during the survey were noted to inform the need for furthers surveys, management and/or eradication.

2.2.2 PROTECTED SPECIES

Concurrently with the habitat survey, the Site was also assessed for its suitability to support protected species that may occur in the locality. Any signs and sightings of protected species were noted where present.

2.2.2.1 BADGER

A search for badger setts and signs of their presence was undertaken within the ESA. This included a search for badger paths, footprints, latrines, dung pits, or badger hairs caught at fence lines.

2.2.2.2 BATS

In accordance with Bat Conservation Trust (BCT) guidelines[19], a Daytime Bat Walkover (DBW) was carried out to identify the presence of potential bat habitats within the ESA. The DBW consisted of a ground-level non-intrusive visual assessment of accessible areas within the ESA to determine the presence of roosting, foraging, commuting and swarming habitats; and to inform the need for further bat surveys.

The suitability of accessible habitats and potential roost features (PRFs) were classified as None, Negligible, Low, Moderate or High; and accessible trees were classified as None, FAR (Further Assessment Required) or PRF (Potential Roost Feature is present).

[18] UK Habitat Classification [Online] Available at: <UKHab> (last accessed May 2025)
[19] Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines.4th edition. The Bat Conservation Trust, London.

No activity surveys were undertaken due to the limited scale of the Proposed Development and retention of existing linear features within and adjoining the ESA.

2.2.2.3 GREAT CRESTED NEWT

Habitat Suitability Index (HSI) Assessment

Whilst great crested newt may utilise suitable terrestrial habitats up to 500 m from their breeding sites, research indicates that most animals are typically encountered within approximately 100 m of their breeding site, with a notable decrease in abundance beyond 200-250 m from their breeding site[20]. Therefore, 250 m was considered an appropriate ZoI in relation to great crested newt.

All accessible waterbodies within 250 m of the Site (the GCN Survey Area), identified from OS mapping and aerial imagery, were subject to a Habitat Suitability Index (HSI) assessment on 29 April 2025. The HSI assessment was undertaken by ERM Principal Consultant Callum Gilhooley ACIEEM under a valid Natural England Class 1 (CL08) Survey License. The Pond plan is shown on **Figure 6**, **Appendix A**.

The purpose of this survey was to verify the presence of waterbodies within the GCN Survey Area and assess their suitability to support breeding great crested newt; in accordance with Oldham *et al*. (2000)[21]. The HSI assessment is a quantitative predictor of habitat suitability for great crested newt that delivers a numerical index between 0 and 1, determined from an assessment of ten habitat variables known to influence the presence of great crested newt including: geographic location, waterbody size, waterbody permanence, water quality, presence of predatory fish and wildfowl, availability of suitable aquatic, marginal and terrestrial habitat; as well as pond density. The suitability of each waterbody was then classified as Poor, Below Average, Average, Good and Excellent as described in ARG UK guidance[22] and shown in **Table 2.1**.

TABLE 2.1 CATEGORISATION OF HSI SCORES

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
Taken from ARG UK[22]	

[20] Natural England (2004) *An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt (ENRR576)*. Available from: http://publications.naturalengland.org.uk/publication/134002. (last accessed May 2025).
[21] Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000) 'Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus)'. *Herpetological Journal* 10(4), 143-155. (last accessed May 2025).
[22] ARG UK. (2010) *Great Crested Newt Habitat Suitability Index: Amphibian and Reptile Groups of the United Kingdom ARG UK Advice Note 5* [online]. Available from: https://www.arguk.org/. (last accessed May 2025).

Environmental DNA Survey

Concurrently with the HSI assessment, all accessible waterbodies within the GCN Survey Area found to contain water were subject to an environmental DNA (eDNA) survey, undertaken by ERM Principal Consultant Callum Gilhooley ACIEEM. In accordance with the Biggs et al. (2014)[23], water samples were recovered from each waterbody between 15 April and 30 June using sterile sample kits. Subsequent quantitative Polymerase Chain Reaction (qPCR) analysis of samples were undertaken by SureScreen Scientifics.

2.2.2.4 OTTER AND WATER VOLE

Previous ecological studies noted that the Bulling Dike may provide suitable foraging and commuting habitats for otter and water vole; however, banksides cannot be accessed safely for closer inspection due to tall vegetation obscuring steep ground above deep water. Therefore, habitat assessments were supplemented by the deployment of two trail cameras along accessible bankside areas near the bridge crossing of the Bulling Dike; as shown on **Figure 7, Appendix A**. Trail cameras were deployed on from 11 September 2024 for 21 consecutive days, which is considered sufficient timescale to detect the presence of any otter or water vole regularly using the Bulling Dike adjoining the Site. Upon collection, footage was reviewed by experienced ecologists to identify any species encountered.

2.2.2.5 REPTILES

Previous ecological studies noted that open grassland areas may provide suitable habitats for widespread species of reptile. Therefore, a reptile survey was undertaken at the Site by ERM Senior Consultant Alex Marsden and Principal Consultant Callum Gilhooley ACIEEM.

In accordance with Froglife (1999) [24], artificial was deployed at a density of between 5-10 refugia per hectare, based on a recommended size of 0.5 m2 for each refugia. Artificial refugia were deployed at 11 locations across the Site, in order to provide adequate cover of between 6-12 refugia within the 1.2 ha Site. Each survey location consisted of two 0.25 m^2 squares of bitumen roofing felt, positioned in reptile 'hotspots' to maximise potential for reptiles to be detected (e.g. sunny areas where short vegetation or bare ground is in close proximity to cover). The extent of the reptile survey is shown on **Figure 8**, **Appendix A**.

Refugia was deployed on 28 August 2024 and left to 'bed in' to the vegetation for two weeks. As recommended by Froglife (1999), each refugia was inspected on six separate occasions in suitable weather conditions. Each visit was scheduled to be completed when air temperatures were forecast to be between 10°C and 18°C, with no heavy rain or high wind. Weather conditions for each survey visit are summarised in **Table 2.2**.

[23] Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R.A., 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.
[24] Froglife. (1999) *Froglife Advice Sheet 10: Reptile Survey* [online]. Available at: <https://www.wildcare.co.uk/> (last accessed May 2025).

TABLE 2.2 REPTILE SURVEY TIMINGS

Visit Number	Date of Survey	Start Time	Weather
1	11/09/2024	09:26	Temperature (ºC): 10.5 Cloud Cover (Oktas): 6/8 Wind (Beaufort): 4 Precipitation: None
2	12/09/2024	09:34	Temperature (ºC): 10 Cloud Cover (Oktas): 5/8 Wind (Beaufort): 1-2 Precipitation: None
3	24/09/2024	10:15	Temperature (ºC): 12 Cloud Cover (Oktas): 7/8 Wind (Beaufort): 3 Precipitation: None
4	26/09/2024	10:11	Temperature (ºC): 12 Cloud Cover (Oktas): 8/8 Wind (Beaufort): 1 Precipitation: None
5	08/10/2024	10:24	Temperature (ºC): 14 Cloud Cover (Oktas): 7/8 Wind (Beaufort): 3 Precipitation: None
6	10/10/2024	10:10	Temperature (ºC): 18 Cloud Cover (Oktas): 2/8 Wind (Beaufort): 3 Precipitation: None

2.2.3 SURVEY LIMITATIONS

Surveyors had access to the full Site boundary, however, it was not possible to fully inspect small areas of dense scrub located towards the southwest of the Site and along the northern bankside of the Bulling Dike. In addition, hemlock was present around the area of dense scrub towards the southwest of the Site, which was avoided on H&S grounds. In area of dense scrub, surveyors visually assessed adjoining areas to search for relevant field signs that might indicate that dense vegetation is regularly utilised by a protected species (e.g. mammal paths, footprints, etc). Therefore, whilst evidence within inaccessible areas may have been missed, and due to the small extents of dense scrub, this is not considered to be a significant limitation.

The UKHab survey presented in this report was conducted in September, after some botanical species had finished flowering; and it is possible that some species present within the ESA were not recorded. Diagnostic vegetative characteristics for prevailing species within the ESA were still discernible; therefore, the timing of the survey is not considered to be a significant limitation in meeting the report's objectives.

The initial deployment of artificial refugia on 28 August 2024 consisted of single 0.25 m^2 squares of bitumen roofing felt at each survey location, which is below the minimum recommended density of refugia described in Froglie (1999). Therefore, an additional 0.25 m^2 square of bitumen roofing felt was placed at each survey location during the first visit on 11 September 2024, in order to achieve the minimum recommended density of refugia described in Froglie (1999). It is noted that the artificial refugia of 0.50 m^2 is based on a compromise between providing adequate cover and being easily lifted/carried (Froglife 1999); however,

smaller refugia (as small as 0.5 m x 0.3 m in size) are effective in detecting reptiles when placed at a density of 10 per hectare[25]. Given that artificial refugia were initially left to bed in for two weeks, and that remaining visits at the recommended density of refugia were completed in suitable weather conditions during the active season (March to October inclusive), this is not considered to be a significant limitation in meeting the report's objectives.

2.3 ECOLOGICAL IMPACT ASSESSMENT

The methodology used to assess effects on ecology and nature conservation has been assessed using current CIEEM guidelines for EcIA[1]. The assessment involved:

- Identifying important ecological features (IEFs) that may be affected by the Proposed Development based on the Desk Study and Field Surveys;
- Setting out embedded mitigation inherent to the Proposed Development such as good practice, requirements for legal compliance and design measures;
- Predicting likely impacts (actions resulting in changes to an ecological feature) and assessing resultant effects (outcome resulting from an impact upon the conservation status or structure and function of an ecological feature) arising from construction and operation;
- Setting out specific mitigation and compensatory measures to avoid potentially significant effects on IEFs;
- Identifying enhancement measures that would improve biodiversity at the Site; and
- Assessing residual effects (predicted to remain after the implementation of mitigation, compensation and enhancement measures) of the Proposed Development.

Based on current CIEEM guidelines for EcIA, the assessment of likely significant and residual effects categorises effects as *significant* or *not significant* and quantifies them in relation to the *geographic scale at which the effect is significant*. This depends on the likely severity and spatial scale of effects, the level at which the integrity of an ecological receptor will likely be affected, and whether the effects will likely result in a temporary or more permanent long-term effect on the extent, size or integrity of a site, habitat, species assemblage or community, population, or group (**Appendix B**).

Legal protection is considered separately from value. The protection of a particular ecological feature through international or national legislation does not mean that the feature is of international or national importance. For example, badgers and their setts are protected under national legislation, the Protection of Badgers Act (1992)[26], but this does not mean that the presence of a badger sett is of national importance. Where present, legally protected species are included in the mitigation strategy so that the Applicant can comply with relevant legislation.

[25] Cathrine, C. (2018) *ARG UK Advice Note 10: Reptile Survey and Mitigation Guidance for Peatland Habitats*. Amphibian and Reptile Groups of the United Kingdom [online]. Available at: <https://www.froglife.org/> (last accessed May 2025).
[26] HM Government (1992). Protection of Badgers Act 1992. Available at: <https://www.legislation.gov.uk/ukpga/1992/51/contents.> (last accessed May 2025).

3. RESULTS

The following section summarises results of the desk study and field surveys and, on the basis of the information available, determines whether a feature is an IEF and therefore subject to further assessment.

3.1 DESK STUDY

3.1.1 DESIGNATED SITES

3.1.1.1 SITES OF SPECIAL SCIENTIFIC INTEREST

The Dearne Valley Wetlands SSSI comprises a series of wetland and scrub habitats along a 10 km length of the River Dearne. At its nearest point, it is located to the immediate east of the Site; as shown in **Figure 2**, **Appendix A**.

The Dearne Valley Wetlands SSSI is designated for a range of ornithology features including breeding birds (gadwall, garganey, pochard, bittern, black-headed gull and willow tit); non-breeding birds (gadwall and shoveler) and an assemblage of breeding birds of lowland damp grasslands, lowland scrub and a mixed assemblage of lowland open waters and their margins and Lowland fen.

All SSSI units are in favourable condition. The units closest to the Site, and their primary habitats, are as follows:

- 008 – Doveside. Broadleaved, mixed and yew woodland – lowland;
- 009 – Parkhill. Broadleaved, mixed and yew woodland – lowland;
- 010 – Wombwell Ings. Standing open water and canals; and
- 011 – Broomhill Flash. Standing open water and canals.

Due to the proximity of the SSSI and the potential for indirect effects (e.g. disturbance to SSSI notified features) the Dearne Valley Wetlands SSSI is considered an IEF and is assessed further in **Section 4 (Impact Assessment)**.

3.1.1.2 LOCAL WILDLIFE SITES

Parkhill Nature Reserve, Broomhill Flash/Wombwell Ings and Gipsy Marsh are located within 1 km of the Site; as shown on **Figure 3**, **Appendix A**. All three are former Local Wildlife Sites (LWS) that have been incorporated into the Dearne Valley Wetlands SSSI. No other LWSs have been identified within 1 km of the Site; therefore, LWS are not subject to further assessment.

3.1.2 PRIORITY HABITATS

Three priority habitats have been identified within 500 m of the Site: Coastal and Floodplain Grazing Marsh, Deciduous Woodland and Traditional Orchard. None are present within the ESA; as shown on **Figure 4, Appendix A**.

Due to the lack of priority habitat within the Site and immediate surrounds, there are no pathways for potential effects. Therefore, these priority habitats are not considered IEFs; and not assessed in **Section 4 (Impact Assessment)**.

3.1.3 PROTECTED OR PRIORITY SPECIES

Based on a review of MAGIC mapping, no European Protected Species Mitigation Licence (EPSML) applications were identified within 2 km of the Site.

Records of protected or priority species within a 2 km radius of the Site are summarised in **Table 3.1**. Where multiple records were provided for a species, the nearest and most recent record is presented. Birds are excluded from the **Table 3.1** but considered separately in **Section 3.1.4 (Birds)**.

TABLE 3.1 PROTECTED OR PRIORITY SPECIES ACCOUNTS WITHIN 2 KM OF THE SITE

Group	Species	Designation[27]	No.	Date	Distance
Amphibians	Great crested newt	HR; NERC; LBAP	6	2017	2.0 km, SW
	Common toad	NERC; LBAP	336	2019	1.8 km, SW
Reptiles	Common lizard	WCA; NERC; LBAP	1	2018	2.0 km, SE
	Grass snake	WCA; NERC; LBAP	21	2020	1.8 km, SE
Mammals	Leisler's bat	HR; LBAP	1	2016	2.0 km, SE
	Noctule bat	HR; NERC; LBAP	2	2021	1.6 km, NE
	Soprano pipistrelle	HR; NERC; LBAP	9	2021	1.6 km, NE
	Common pipistrelle	HR; LBAP	19	2021	1.5 km, NE
	Hedgehog	NERC; LBAP	12	2023	1.7 km, SE
	Brown hare	NERC; LBAP	2	2019	0.5 km, W
	Otter	HR; NERC; LBAP	2	2016	1.4 km, SE
	Badger	PBA; NERC	2	2021	0.3 km, W
Molluscs	Little whirlpool ramshorn snail	NERC	2	2018	1.9 km, SE
Inverts.	Dingy skipper	NERC; LBAP	19	2024	1.9 km, SE

3.1.4 BIRDS

In lieu of bird surveys being completed, the Site has been subject to a detailed desk-based review. This approach is considered proportionate to the nature of the Proposed Development and potential effects and was agreed with the Local Planning Authority and Natural England via email.

The BBRC returned 67 records of 22 bird species of conservation importance[28] from within the 2 km of the Site since 01 January 2019. Of these, 44 records relate to RSPB Dearne Valley (Old Moor), located approximately 1.4 km southeast of the Site and beyond the A6195 trunk road at Broomhill. All records are of species typical of the geographic area and habitats present.

RSPB returned 4,828 records of 151 bird species within 2 km of the Site since 01 January 2019. The records are primarily from the nearby RSPB nature reserves and immediate

[27] HR (Conservation of Habitats and Species Regulations 2017); WCA (Wildlife and Countryside Act 1981); PBA (Protection of Badgers Act 1992); NERC (Natural Environment and Rural Communities Act 2004); LBAP (Barnsley Biodiversity Action Plan).
[28] Matching one or more of the following criteria: Schedule 1 of the Wildlife and Countryside Act 1981, Annex I of the Birds Directive, Red/Amber-listed Birds of Conservation Concern (Stanbury, et al. 2021)

surrounds that include common and widespread species typical of the varied habitats present; as well as species of conservation importance. There are records of all SSSI notified features and several Schedule 1-listed bird species, which will be considered further where relevant in this assessment.

The Site has the potential to support a limited range of widespread bird species. The grassland habitats may support skylark, either as a foraging or nesting resource. Grassland habitats, such as natural grassland, support an averages of up to 0.27 skylark territories per hectare[29], therefore the Site itself is likely to only form a small part of any skylark territories. The areas of tall forbs likely reduce suitability for the skylark but may support other species such as whitethroat or sedge warbler. Nearby scrub is expected to support a range of widespread passerine species and arable habitats to the east assumed to support skylark and, if crop types and timings suit, lapwing.

The habitats in the surrounding landscape that are likely to be of most value to birds are the wetland areas within the SSSI, which are located at least 300 m to the east and southeast and support a range of waterbird species.

Due to the potential for nesting birds within the Site and immediate surrounds there is potential pathway for effects from the Proposed Development. Birds are therefore considered an IEF and are assessed further in **Section 4 (Impact Assessment)**, including consideration of SSSI notified features.

3.2 FIELD SURVEYS

The following section provide a summary of the results of the field surveys. Any features not specifically discussed here is due to the Site being located outside their current natural range, there is an absence of supporting habitat and/or that any habitat features encountered within specified survey areas are considered unsuitable to support the species.

3.2.1 HABITATS

A total of eight habitats have been identified within or adjacent to the survey area; as summarised in **Table 3.2**; and shown on **Figure 5**, **Appendix A**.

TABLE 3.2 UKHAB CLASSIFICATIONS WITHIN THE ESA

Ecosystem	Code*	Habitat
Grassland	g4	Modified grassland
	g4 (10)	Scattered scrub
	g4 (16)	Tall forbs
Arable and horticulture	c1c	Cereal crops
Heathland and scrub	h3d	Bramble scrub
Urban	u1b	Developed land; sealed surface
Rivers and lakes	r2g	Other rivers and streams

[29] Fox, H. (2022) *Are Skylarks Being Overlooked in Impact Assessment?* In InPractice by Chartered Institute of Ecology and Environmental Management (CIEEM), Issue 117 (September 2022). Available at: <https://cieem.net/> (last accessed May 2025).

* relevant secondary codes added in parenthesis

3.2.1.1 GRASSLAND

Most of the ESA comprised modified grassland that had been left unmanaged for some time. Tall forb species have established in many areas (secondary code 16), and scattered scrub was present to the north of the Bulling Dike (secondary code 10).

Modified grassland - g4

The modified grassland sward height varied between 10-50 cm and comprised abundant recordings of false oat grass *(Arrhenatherum elatius)* and Yorkshire-fog (*Holcus lanatus*). Frequent recordings of perennial rye-grass (*Lolium perenne),* creeping thistle (*Cirsium arvense*) and ragwort (*Jacobaea vulgaris*). Occasional recordings of meadow grasses (*Poa sp.*), ribwort plantain (*Plantago lanceolata*), creeping buttercup (*Ranunculus repens*), spear thistle (*Cirsium vulgare*), broad-leaved plantain (*Plantago major*), white clover (*Trifolium repens),* great willowherb (*Epilobium hirsutum*), common nettle (*Urtica dioica*), hemlock (*Conium maculatum*), hogweed (*Heracleum sphondylium*), cleavers (*Galium aparine).* Rare recordings of reed grass *(Phragmites australis),* marsh horsetail (*Equisetum palustre*), great brome (*Bromus diandrus*), common dandelion (*Taraxacum officinale*) and cut-leaved geranium (*Geranium dissectum*).

Tall Forbs - g4, 16

The tall forbs comprised locally abundant common nettle, hemlock, and hairy willowherb (*Epilobium hirsutum*). Frequent recordings included bramble (*Rubus fruticosus agg.*), spear thistle, cleavers, hedge woundwort (*Stachys sylvatica*), common toadflax (*Linaria vulgaris*), and Siberian dogwood (*Cornus alba*), curly dock (*Rumex crispus*) and hogweed. Elder (*Sambucus nigra*) bushes were also recorded in the central and southwestern part the ESA, near the bramble scrub.

Scattered scrub - g4, 10

Scattered scrub was recorded to the north of the Bulling Dike in the north of the ESA comprising young silver birch (*Betula pendula*) trees, butterfly-bush (*Buddleja davidii*), elder, ivy (*Hedra helix*) and bramble.

3.2.1.2 ARABLE AND HORTICULTURE

Cereal crop - c1c

An arable field was recorded in the east of the ESA, comprising a monoculture of cereal crop with no field margin and a sward height of approximately 10 cm.

3.2.1.3 HEATHLAND AND SCRUB

Bramble scrub - h3d

Bramble scrub was recorded towards the southwest of the ESA, and interspersed with bindweed.

3.2.1.4 URBAN

Developed land; sealed surface - u1b

Hardstanding is present in the form of access tracks and a laydown area understood to be periodically used for storing vehicles, equipment and materials (e.g. soil, sludge cake, etc).

3.2.1.5 OTHER RIVERS AND STREAMS

River - r2b

A section of the Bulling Dike is present in the north of the ESA. The channel was approximately 1 m wide with banksides up to 3 m in height. The southern bank was typically angled at approximately 45 degrees, and the northern bank steeper at 60 degrees. Both banks were vegetated by a mixture of tall grassland species, forbs and scrub. Marginal vegetation in the form of reeds typically shaded one-third of the stream. During the time of the survey the water level appeared approximately 0.5 m deep, slightly discoloured, silty and with a very little discernible flow. The watercourse was culverted for circa 4 m where the access track crosses Bulling Dike.

3.2.1.6 INDIVIDUAL TREES

No individual trees were recorded within the ESA. Two sycamore were recorded along the northern bank of the Bulling Dike, which contain a young quaking aspen (*Populus tremuloides*) tree with several saplings adjoin the southern extent of the ESA; and a semi-mature species of willow (*Salix sp.*) adjoins the western extent of the ESA.

3.3 PROTECTED SPECIES

3.3.1 BADGER

Previous ecological studies found no evidence of badger within 30 m of the Site.

BBRC provided two records of badger in 2021, the closest being within approximately 500 m of the Site.

No badger setts or evidence of badger activity was recorded within the ESA. Habitats within the ESA, to the south of the Bulling Dike, provide suitable foraging habitat for badger but limited opportunities to establish setts.

Due to the lack of evidence of badger within the ESA, they are not considered an IEF and not subject to further assessment.

On the basis that badger are present in the wider landscape, and individuals could be present in future years, mitigation for badger is included so that planned works comply with relevant wildlife legislation.

3.3.2 BATS

Previous ecological studies found no trees with potential roost features (PRFs) for bats within 50 m of the Site. Buildings within the treatment works contained PRFs considered to be of Low suitability for bats. No bats were observed emerging from any buildings during previous surveys; although, foraging and commuting noctule, common pipistrelle and soprano pipistrelle were recorded in the locality.

BBRC provided records of four species of bat: Leisler's, noctule, common pipistrelle and soprano pipistrelle.

3.3.2.1 ROOSTING BATS

Trees and buildings within the ESA, and the bridge crossing of the Bulling Dike, are considered to be of Negligible suitability for roosting bats.

Due to the lack of potential roost features within the ESA, roosting bats are not considered an IEF and not subject to further assessment.

3.3.2.2 FORAGING AND COMMUTING BATS

Habitats within the ESA are generally considered to be of Low suitability for foraging and commuting bats, as they are extremely limited in scale and situated on the edge of more extensive grassland and scrub habitats that are similar in quality. Linear features along the east of the ESA consists of low-lying scattered scrub along the edge of an extensive arable field of Negligible suitability for bats. The section of the Bulling Dike within and adjoining the ESA is considered to be of Low suitability for foraging and commuting bats. Banksides are largely open and devoid of extensive tree cover and due to the prevailing agricultural land use to the east of the ESA, has limited connectivity to extensive bat habitats to the east.

Given the Low suitability of habitats within the ESA, and that linear features are not considered to be important, foraging and commuting bats are not considered to be an IEF and not subject to further assessment.

3.3.3 GREAT CRESTED NEWT

Previous ecological studies found no evidence of great crested newt eDNA within any accessible ponds identified within 250 m of the Site.

BBRC provided six records of great crested newt from within 2 km of the Site from 2017, the closest being approximately 2.0 km southwest of the Site.

Three ponds were identified within the GCN Survey Area; as shown on **Figure 6**, **Appendix A**. No evidence of great crested newt eDNA was recorded any of these ponds in 2025; as described in **Appendix D**. Therefore, great crested newt are considered to be absent from terrestrial habitats within the GCN Survey Area and great crested newt were not subject to further assessment.

3.3.4 OTTER

Previous ecological studies considered the Bulling Dike provided suitable aquatic habitat for foraging and commuting otter, with potential for areas of scrub to be utilised as resting sites. However, no evidence of otter was recorded.

BBRC provided two records of otter within 2 km of the Site, the closest being approximately 1.4 km southeast of the Site towards RSPB Dearne Valle (Old Moor).

No evidence of otter was recorded in 2025, and no sightings of otter were captured on trail cameras, the positions of which are shown on **Figure 7**, **Appendix A**. Whilst aquatic habitats within the ESA could support foraging and commuting otter, the Bulling Dike stops approximately 1.5 km northwest of the Site at Netherwood Country Park, with the channel and banksides becoming increasingly scrubbed and vegetated. Other watercourses and wetlands

downstream of the Bulling Dike provide more suitable and extensive aquatic habitats, which otter are likely to utilise more regularly.

Given the lack of evidence of otter, potential riparian and aquatic habitats within and adjoining the ESA are not extensive, upstream connectivity to other suitable aquatic habitats are very limited, otter are not considered to be an IEF and not subject to further assessment.

3.3.5 WATER VOLE

Previous ecological studies classified the Bulling Dike as being sub-optimal for water vole due to prevailing grassland and scrub habitats along bankside areas; as well as a lack of any marginal vegetation considered to be suitable for water vole. No evidence of water vole was recorded.

BBRC provided no records of water vole within 2 km of the Site.

No evidence of water vole was recorded in 2025, and no sightings of water vole were captured on trail cameras, the positions of which are shown on **Figure 7**, **Appendix A**. Habitats within the ESA are considered to be sub-optimal for water vole due to a lack of aquatic or emergent vegetation considered to be suitable for water vole.

Given the lack of evidence of water vole and potential riparian and aquatic habitats within and adjoining the ESA are not extensive, water vole are not considered to be an IEF and not subject to further assessment.

3.3.6 REPTILES

Previous ecological studies considered open grassland tall ruderal and scrub habitats as suitable habitats for widespread species of reptile; as well as the Bulling Dike providing suitable aquatic habitat for grass snake.

BBRC provided one record of common lizard approximately 2 km southeast of the Site in 201. There 21 records of grass snake identified, with the closest being approximately 1.8 km southeast of the Site.

No evidence of reptiles were recorded within the ESA in 2025, the survey extent of which is shown on **Figure 8**, **Appendix A**.

Due to the lack of evidence of reptiles within the ESA, they are not considered to be an IEF and not subject to further assessment.

4. IMPACT ASSESSMENT

This assessment considers effects from the Proposed Development at the Site and immediate surrounds. Examples of the potential effects considered which can be positive or negative include:

- Loss of habitat or species of flora and fauna from permanent or temporary land take;
- Disturbance to, or displacement of, a species from the Site because of permanent or temporary land take;
- Impacts to adjacent habitats (and the species that use them) that are not directly required for construction or operation (e.g., through movements of vehicles and site personnel, lighting, dust, noise and vibration, discharges to water, alteration to drainage regimes);
- Fragmentation of habitat or severance of ecological corridors (such as watercourses, hedgerows and flyways); and
- Creation of new habitat and the introduction of species because of reinstatement works and landscaping.

4.1 EMBEDDED MITIGATION

During the design of the Proposed Development, ecological survey results were provided to the design team to ensure that, where possible, effects on protected or priority ecosystems, habitats and species were avoided. Where potential effects could not be avoided, measures were implemented to reduce the effect in line with the mitigation hierarchy.

4.1.1 MITIGATION BY GOOD PRACTICE: DESIGN

The following measures have been included within the design to avoid impacts on protected or priority ecosystems, habitats and species:

- Areas outside of the Site are excluded from the Proposed Development (including temporary works, access and/or material storage);
- No infrastructure will be located within 8 m from the top of the bank to the Bulling Dike;
- Any tree at risk of incidental damage during construction will be excluded from the construction impacts through a suitable Root Protection Zone (RPZ). The RPZ will be defined by a competent arborist or landscape professional. No works or vehicle movements will be permitted within the RPZ without written permission from a qualified arborist or landscaping professional;
- Given the sensitivity of the habitats in the adjoining Dearne Valley Wetlands SSSI, site clearance and construction activities should be completed during the non-breeding bird season (i.e. September to February inclusive). In the event that site activities cannot avoid the non-breeding bird season, specific measures in relation to nesting birds will be required, as described in **Section 4.1.2.3 (Nesting Birds)**;
- It is understood that no permanent lighting is proposed. Should this change, and in line with good practice[30], permanent lighting will be designed to minimise disruption to nocturnal and crepuscular animals that may be present in the locality (e.g. bats, badger, etc.). Permanent lighting proposals will be agreed in advance with an ecologist;

[30] Institution of Lighting Professionals (2023) *Guidance Note GN 08/23 Bats and Artificial Lighting at Night*. Institution of Lighting Professionals, Rugy, Warwickshire, UK.

- It is understood that no working during the hours of darkness (i.e. between sunset and sunrise) will be required. Should this change, temporary lighting proposals will be designed to minimise disruption to nocturnal and crepuscular animals that may be present in the locality (e.g. bats, badger, etc.). Temporary lighting will adhere to the following good practice:
  - avoidance of ultra-violet (UV) lighting; as bats are particularly sensitive to UV light;
  - temporary lighting will be directional and downward facing, using flat-glass protectors on luminaires to help reduce light spill into potential habitats adjoining the Site; and
  - temporary lighting will be switched off when not in use.

4.1.2 MITIGATION BY GOOD PRACTICE: CONSTRUCTION

4.1.2.1 PRECONSTRUCTION SURVEYS

Should construction works not commence within 12-months from the date of this EcIA report, an ecologist must complete an updated badger walkover survey of accessible areas within and up to 30 m from the Site to determine if any additional mitigation is required.

4.1.2.2 ECOLOGICAL CLERK OF WORKS

A suitably qualified and experienced Ecological Clerk of Works (ECoW) will be appointed by the Applicant to provide ecological advice and support to the Principal Contractor during construction, including monitoring of compliance with recommendations of this EcIA.

The ECoW will be provided an opportunity to review and comment on the Principal Contractor's proposed Risk Assessment(s) and Method Statement(s) relating to the Proposed Development to confirm working methods take cognisance of ecological mitigation measures, including specific measures to prevent the spread of invasive/injurious non-native species of plants and recommendations for temporary construction lighting best practices, if required.

Prior to works commencing at the Site (including any advanced works), the ECoW will provide construction personnel with a toolbox talk. The purpose of the toolbox talk will be to highlight potential ecological constraints, mitigation and control measures to follow should a protected species be encountered during the works.

4.1.2.3 NESTING BIRDS

In the event that vegetation removal is required during the nesting bird season (i.e. March to August inclusive) to facilitate any site activity (including advanced/enabling/construction works), potential nesting habitat will be subject to a nesting bird check.

The ECoW/ornithologist will visually inspect vegetation to be affected (and immediate surroundings) to locate active nests and breeding birds. Nesting bird checks must be completed no more than 48 hours prior to vegetation being removed; as it is considered unlikely that a bird will establish a new nest within this timescale.

In the event that no active nests are found, vegetation should be removed promptly using hand tools to minimise potential disturbance to breeding birds in the adjoining SSSI. Arisings should be clear from the Site as soon as practicable. If required, vegetation should be maintained at low levels for the duration of the works to prevent nesting birds from establishing new nests.

In the event that an active nest is found, or suspected, the ECoW/ornithologist will confirm the size of buffer to be installed around the active nest, which will be proportionate to the

sensitivity of the species encountered. No vegetation removal will be permitted within the buffer, which will remain in place until the ECoW/ornithologist confirms in writing that the nest is no longer active and/or that young have fledged the nest of their own accord. As required, buffer zones will be demarcated and monitored by the ECoW/ornithologist to prevent incidental damage or disturbance to active nests.

Should removal of potential nesting bird habitat not occur within 48 hours, further nesting bird checks shall be completed by the ECoW/ornithologist; as described above.

4.1.2.4 MINIMISING NOISE

Construction noise will be minimised where practicable, following guidance set out in British Standard (BS) 5228-1: Code of Practice on Noise Control. This includes consideration of the following:

- Substitution of plant and activities by less noisy ones;
- Modification of plant or equipment to reduce noise emissions;
- The use of noise enclosures;
- The siting of equipment and its method of use; and
- Equipment maintenance.

4.1.2.5 PROTECTING THE WATER ENVIRONMENT

Construction activities (including any advanced works) will be undertaken in accordance with good practice to reduce the potential for damage to the water environment and locally important habitats[31,32]. No infrastructure will be located within 8 m from the top of the bank to the Bulling Dike.

4.1.3 MITIGATION BY GOOD PRACTICE: OPERATION

It is understood that maintenance activities (including routine maintenance of vegetation) will be undertaken in accordance with good practice for landscaping and horticulture.

4.1.4 MITIGATION BY GOOD PRACTICE: DECOMMISSIONING

Decommissioning activities are anticipated to be of a similar nature to the construction phase in terms of scale and duration. Although any enhancements may mean that the importance of some ecological features may change from current levels.

Prior to decommissioning, it is recommended that an ecologist completes a review of the Site to identify any specific requirements in relation to prevailing wildlife legislation and policy requirements. Decommissioning is not considered further in this assessment

4.2 ASSESSMENT OF IEFS

The assessment and assumes all best practice measures summarised in **Section 4.1 (Embedded Mitigation)** are implemented in full.

[31] Environment Agency. (2015) Pollution prevention advice and guidance (PPG) [online]. Available from: <https://webarchive.nationalarchives.gov.uk/ > (last accessed May 2025).
[32] CIRIA. (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532). Construction Industry Research and Information Association [online]. Available from: <https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C532&Category=BOOK> (last accessed May 2025).

4.2.1 DEARNE VALLEY WETLANDS SSSI

4.2.1.1 CONSTRUCTION

The Dearne Valley Wetland SSSI is situated to the immediate east of the Site. Habitats beyond the existing fence line to the east consist of an extensive arable field that will not be directly or indirectly impacted upon the habitats within the SSSI, thus effects are considered negligible and not significant. As the works occur outside of the SSSI and are not likely to damage the SSSI, no assent from Natural England is required.

The nature, scale and timing of human activities can result in disturbance of birds at a level which can affect behaviour, such as changes to nesting, foraging or roosting behaviour.

The Site is located close to an active industrial area, and therefore subject to a degree of background noise and potential aural disturbance stimuli. As such, any birds nesting nearby may have a degree of habituation to noise that is likely to occur during construction. In addition, topography and distance offer both visual and aural screening to any works within the Site from the scrapes and wetland within the adjacent SSSI and nature reserves.

Notified features of the SSSI vary in their ecology, presence and distribution within the SSSI (and supporting habitats), and sensitivity to effects. **Table 4.1** provides an assessment of each feature in turn.

TABLE 4.1 ASSESSMENT OF DEARNE VALLEY WETLANDS SSSI FEATURES

SSSI Feature	Habitat suitability around the Site and desk study summary	Assessment
Aggregations of breeding birds - Bittern, *Botaurus stellaris*	The closest suitable breeding are the reedbeds at Old Moor RSPB, >1.5 km from the Site. RSPB records are primarily from Old Moor, with none from closer wetlands.	Given the distance to the nearest suitable habitat, there will be no effects on bittern from habitat loss or disturbance.
Aggregations of breeding birds - Black-headed Gull, *Larus ridibundus*	A colony nests at Old Moor RSPB. Some of these birds may forage closer to the site, but the Site itself if unsuitable or suboptimal for foraging. The RSPB dataset primarily includes records from Old Moor, but the species is likely to be more widespread. eBird, for example, includes records across the wetland complex, including habitat east of the Site, although numbers in the breeding season are typically low.	Given the distance to the breeding colony, there will be no direct effects on nesting black-headed gull. If birds do forage opportunistically in fields adjacent to the Site they may be displaced, but the effect would be temporary (for the duration of construction, during working hours) and the loss of habitat would be very small in the context of their foraging range, which can extend to 27 km from the colony[33].
Aggregations of breeding birds - Gadwall, *Mareca strepera*	Habitats within the Site are unsuitable for gadwall, but small numbers may nest in wetland areas over 300 m from the Site. The RSPB Dataset includes records of "probable breeding" within the whole reserve network but doesn't specify which wetland/s. eBird shows birds are recorded on Wombwell Ings and Broomhill Flash throughout the year.	Prevailing guidance recommends a buffer of 100-200 m to avoid disturbance during the breeding season[34]. As the closest potential nesting habitat is further from the Site than this, there will be no potential effects on breeding gadwall.
Aggregations of breeding birds - Garganey, *Anas querquedula*	Habitats within the Site are unsuitable for garganey, but they may breed irregularly within the Dearne Valley, potentially including Wombwell Ings and Broomhill Flash, the closest wetlands to the Site. The RSPB dataset includes a record of probable breeding from 2020 but does not specify the location and includes no subsequent observations. The species is present more frequently, with eBird showing annual observations from various areas of the wetland complex, but always in small numbers and breeding is likely to be very difficult to prove due to their secretive habitats.	There is no published disturbance buffer, but similar *Anas* duck species are all 100-200 m[34]. As such, if the species did nest on the closest wetland habitats, at least 300 m away, then significant disturbance is considered very unlikely, especially considering the baseline condition and natural screening present.

[33] Jakubas D, Indykiewicz P, Kowalski J, Iciek T, Minias P. Intercolony variation in foraging flight characteristics of black-headed gulls *Chroicocephalus ridibundus* during the incubation period. *Ecol Evol*. 2020; 10: 5489–5505. **https://doi.org/10.1002/ece3.6291**

[34] Goodship, N.M. and Furness, R.W. (MacArthur Green) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.

SSSI Feature	Habitat suitability around the Site and desk study summary	Assessment
Aggregations of breeding birds - Pochard, *Aythya ferina*	Habitats within the Site are unsuitable for pochard, but very small numbers may nest in wetland areas over 300 m from the Site. The RSPB Dataset includes records of "probable breeding" within the whole reserve network but doesn't specify which wetland/s. eBird shows small numbers are recorded on Wombwell Ings and Broomhill Flash throughout the year, although most records are in winter.	No published disturbance buffer for pochard or similar *Aythya* species. Prevailing guidance recommends a buffer of 100-200 m to avoid disturbance for other duck species during the breeding season[34]. As the closest potential nesting habitat is further from the Site than this, there will be no potential effects on breeding gadwall.
Aggregations of breeding birds - Shoveler, *Anas clypeata*	Very small numbers may nest in wetland areas over 300 m from the Site. The RSPB Dataset includes records of "probable breeding" within the whole reserve network but doesn't specify which wetland/s. eBird shows small numbers are recorded on Wombwell Ings and Broomhill Flash throughout the year, although most records are in winter.	Prevailing guidance recommends a buffer of 100-200 m to avoid disturbance during the breeding season[34]. As the closest potential nesting habitat is further from the Site than this, there will be no potential effects on breeding shoveler
Aggregations of breeding birds - Willow Tit, *Poecile montanus*	No suitable habitat within the Site with the nearest scrub/woodland approximately 100 m south. The last record in the RSPB dataset and eBird was from 2021. As such, the species is considered likely to be extirpated from the area around the Site.	Assumed to be absent from the area due to the lack of recent records. No direct effects and no pathway for indirect effects.
Aggregations of non-breeding birds - Gadwall, *Mareca strepera*	Wetland habitats in the adjacent Wombwell Ings and Broomhill Flash are suitable during the non-breeding season, and the RSPB and/or public datasets show presence throughout the year.	Prevailing guidance recommends a buffer of 100-200 m to avoid disturbance during the non-breeding season[34]. As the closest suitable habitat is further from the Site than this, there will be no potential effects on wintering gadwall.
Aggregations of non-breeding birds - Shoveler, *Anas clypeata*	Wetland habitats in the adjacent Wombwell Ings and Broomhill Flash are suitable during the non-breeding season, and the RSPB and/or public datasets show presence throughout the year.	Prevailing guidance recommends a buffer of 100-200 m to avoid disturbance during the non-breeding season[34]. As the closest suitable habitat is further from the Site than this, there will be no potential effects on wintering shoveler.
Assemblage of breeding birds - Lowland damp grasslands.	Interest features listed in the citation include lapwing *Vanellus vanellus*, snipe *Gallinago gallinago* and redshank *Tringa totanus*. The Site does not contain lowland damp grassland, and the habitats are unsuitable for any of the interest features or similar species to breed. Lapwing may nest in adjacent arable field, if crop timings suit, although this is likely to be further east to avoid perches suitable for predators. Other species may breed in	Prevailing guidance recommends a buffer of 100-200 m to avoid disturbance during the breeding season for redshank[34], which is less than the distance to the closest suitable nesting habitat. Many other waders have a comparable buffer zone, and it is not expected that the Development will cause disturbance to nesting birds.

SSSI Feature	Habitat suitability around the Site and desk study summary	Assessment
	grassland habitat >200 m away from the Site, if suitable. Other species may breed at nearby Wombwell Ings and Broomhill Flash, as suggested by the desk study.	
Assemblage of breeding birds – Mixed open water, margins and fen	Interest features listed in the citation include sedge warbler *Acrocephalus schoenobaenus*, water rail Rallus aquaticus, reed bunting *Emberiza schoeniculus* and bearded tit *Panurus biarmicus.* As well as other qualifying features, water and margins support tufted duck *Aythya fuligula* and avocet *Recurvirostra avosetta.* The Site does not include these habitats and is unsuitable for any of the listed interest features or similar species. Wetland and margins over 200 m away from the Site may be suitable for some species.	The nearest possible habitat for listed and similar features is at least 300 m from the Site, and therefore there will be no direct habitat loss. There is no recommended buffer in the UK for Avocet, but some research in Europe has shown birds were disturbed at approximately 100 m[35]. As potentially suitable nesting is substantially further than this, and there is some natural screening, no disturbance is expected of avocet or similar features is expected.
Assemblage of breeding birds - Scrub	Interest features listed in the citation include long-tailed tit *Aegithalos caudatus*, garden warbler *Sylvia borin*, grasshopper warbler *Locustella naevia*, lesser whitethroat *Sylvia curruca*, linnet *Carduelis cannabina* and yellowhammer *Emberiza citronella.* There is no scrub within the Site and the Site is unsuitable for any listed features or similar species to breed.	Given the distance to the nearest notable areas of scrub, there is no impact pathway for effects on passerine species associated with this habitat.

[35] Francesco Scarton. Flight initiation distances in relation to pedestrian and boat disturbance in five species of waders breeding in a Mediterranean lagoon. Revue d'Écologie, 2018, 73 (3), pp.375-384. ffhal-03532880f

Most notified features of the SSSI are not likely to regularly utilise habitats within and adjoining the Site; and potential effects are not predicted to be significant.

If construction falls within the months of September to February (inclusive), no mitigation is required. Should construction fall within the breeding season of March to August, it is recommended that the applicant consults with the local RSPB reserve team and Garganey Trust to understand any possible constraints on nearby reserve/SSSI land and agree the requirement for and nature of any additional mitigation.

4.2.1.2 OPERATION

Operation and maintenance of the Proposed Development will be limited to areas within the Site, which is situated next to an active industrial area. It is likely that there will be periodic vehicle movements and human presence throughout the operational period, as site personnel and security staff undertake temporary maintenance works and inspections. Therefore, there will be a low risk of disturbance to qualifying features of the Dearne Valley Wetlands SSSI, should they be using adjacent fields; however, any effects will be temporary, reversible of negligible magnitude and not significant.

4.2.2 BIRD ASSEMBLAGE

4.2.2.1 CONSTRUCTION

The Site and immediate surrounds have limited potential to support breeding birds, but those that are present may be subject to effects such as habitat loss/modification or disturbance.

The Site itself may support breeding skylark, but the limited area would only represent a small part of any individual territory. Skylark do forage within solar developments, therefore the area would not be lost as a resource as skylark nesting nearby (i.e. skylark in the arable field to the east may still use the Site for foraging). Given the relatively small size of the Site and transient nature of the habitats (i.e. opportunistic colonisation by forbs and bramble during periods of low maintenance), the Site and immediate surrounds do not represent an important resource to any bird species or population, and individual birds that may occur within the boundary are of Site importance only. As such, any potential effects during the construction phase on the breeding assemblage within the Site would not be significant.

Schedule 1-listed bird species are subject to additional protection from disturbance when nesting. The ditch between the Site and the adjacent water treatment works likely represents suitable nesting habitat for Cetti's warbler (*Cettia cetti),* which typically nests in ditches, reedbeds and waterside scrub; however, the Site itself is not suitable. There will be no direct loss to breeding or foraging habitat. If birds do nest along the nearby ditch or associated vegetation, they are likely to be habituated to a degree of disturbance due to the presence of water treatment works and other industry, and no significant effects are predicted.

Little ringed plover may occur in wetland areas over 300 m from the Site if water levels suit, although the Site itself in unsuitable. Prevailing guidance recommends a buffer of 100-200 m to avoid disturbance during the breeding season for a similar species: (common) ringed plover, *Charadrius hiaticula,* which is less than the distance to the closest suitable nesting habitat. As the closest suitable habitat is further from the Site than this, there will be no potential effects on little ringed plover.

Barn owl may forage within the Site but there limited suitable nesting sites in the surrounds. The RSPB Dataset includes records of "probable breeding" within the whole reserve network

but doesn't specify which wetland/s. eBird shows irregular records nearby, mostly on Wombwell Ings. The panels will not stop barn owl from hunting within the Site[36] and there will be no disturbance to nesting birds as there are no suitable locations close to the Site.

4.2.2.2 OPERATION

Operation and maintenance of the Proposed Development will be limited to areas within the Site, which is situated next to an active industrial area. It is assumed that works will include periodic management of vegetation which should be conducted in a sensitive way to potential avoid effects on nesting birds.

4.3 CUMULATIVE EFFECTS

This assessment has considered cumulative effects which can result from individually insignificant but collectively significant actions taking place over a period of time concentrated in a location (e.g., where the ZoI of other projects overlap with the Proposed Development).

Due to the small-scale nature of the Proposed Development, limited ecological value of the Site, and extremely limited effects in isolation, no significant cumulative effects are predicted.

4.4 CONCLUSIONS

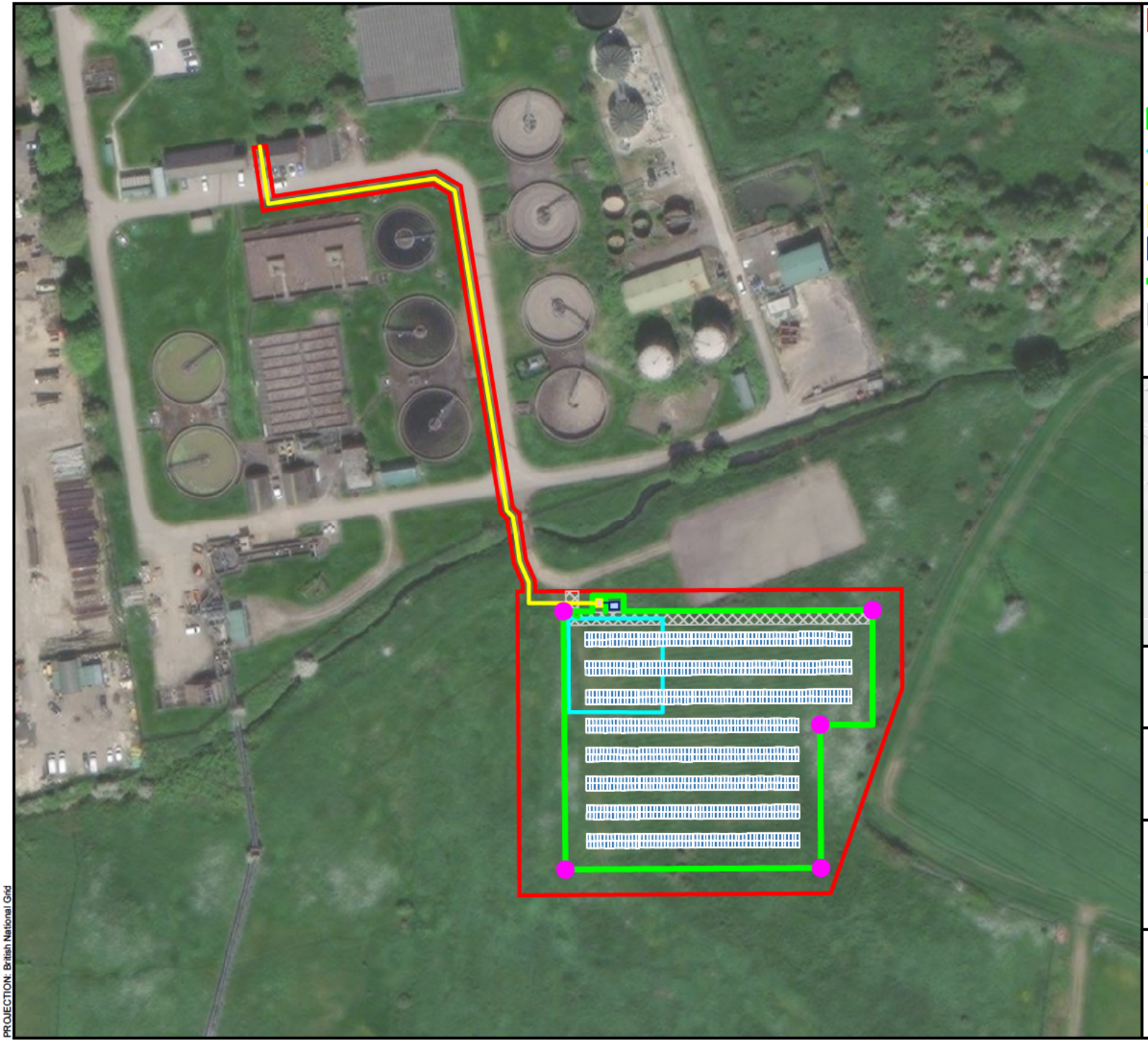
This report outlines the baseline results encountered during field surveys and desk-based assessments undertaken in 2024 and 2025. Recommendations have been made in relation to embedded, general and specific mitigation measures. On the basis of the above assessment, no significant residual effects are predicted.

4.5 REPORT LIFESPAN

Unless otherwise agreed with Barnsley Metropolitan Borough Council, the details of this report are valid for a period of two years; in accordance with current CIEEM guidelines[37]. In the event that construction activities do not commence within this timescale, a professional ecologist must undertake a site visit and, following any updated desk study, review the validity of this report and advise on whether some or all of the ecological surveys may need to be updated.

[36] https://www.barnowltrust.org.uk/barn-owls-ground-mounted-solar-panels/
[37] CIEEM. (2019) *Advice Note on the Lifespan of Ecological Reports and Surveys* [online]. Available from: https://cieem.net/. (last accessed May 2025).

APPENDIX A FIGURES



- Site Boundary
- Solar PV Module
- CCTV
- Gate
- Temporary Construction Compound
- Cabel Route
- Transformer
- Switchgear
- Fence
- Proposed Access Road



0 20 40 60 80 100

Metres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: CR
PROJECT: 0747884	CHECKED: AB
DATE: 09/06/2025	APPROVED: IG

Figure 1: Site Location & Layout
Wombwell WWTW Solar
Ecological Impact Assessment (EcIA)

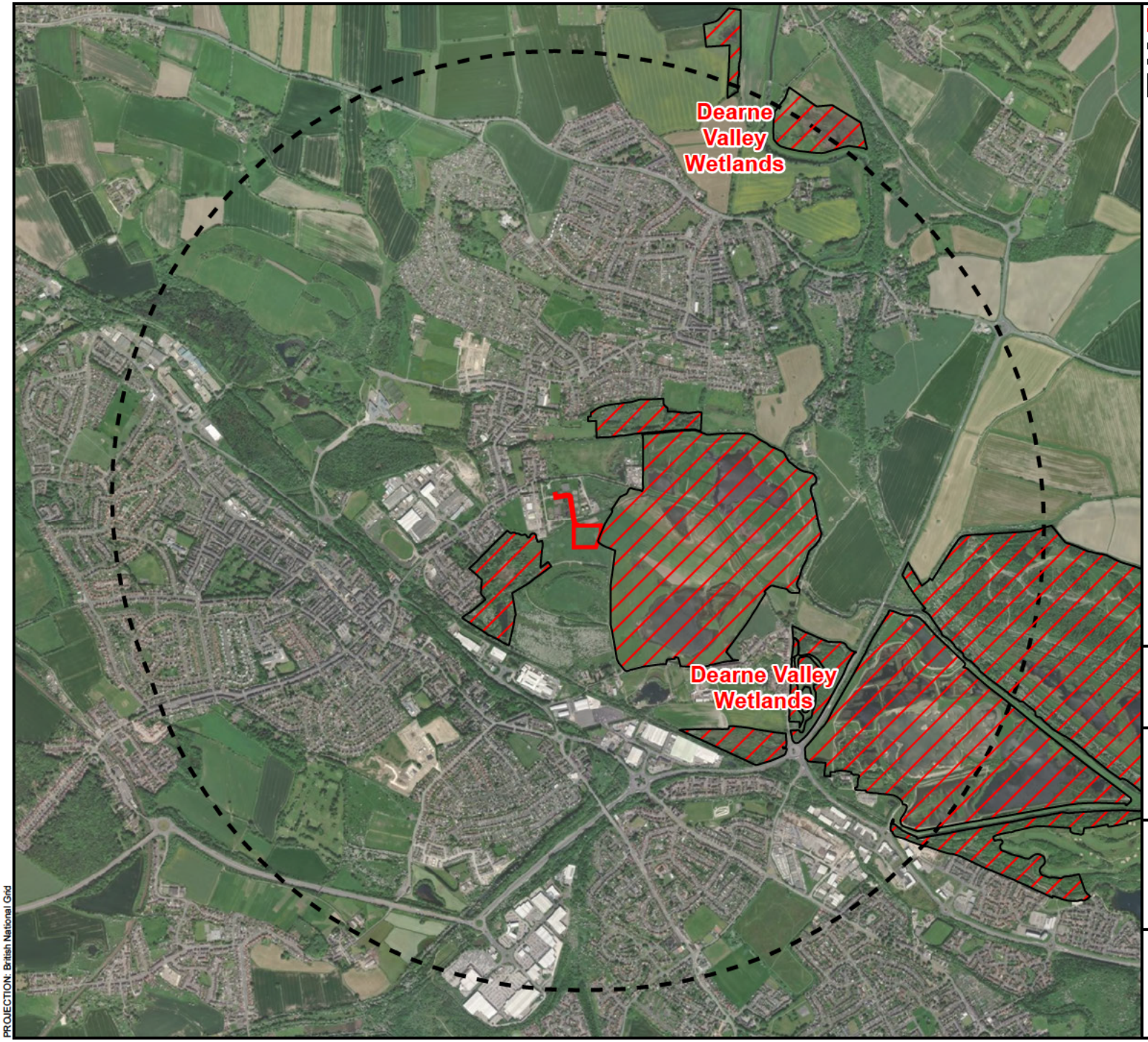
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Downing

PROJECTION: British National Grid

Maxar, Microsoft, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Path: \\UKSPRDGISFS01\Data\London\Projects\0747884 - Wombwell\Maps\0747884 - Wombwell.aprx\0747884 - Wombwell - Fig 1 - Site Layout & Boundary - A01



Site Boundary

2 km Buffer of Site Boundary

Site of Special Scientiic Interest (SSSI)

0 200 400 600 800 1,000

Metres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: CR
PROJECT: 0747884	CHECKED: AB
DATE: 09/06/2025	APPROVED: IG

Figure 2: Statutory Designated Sites
Wombwell WWTW Solar
Ecological Impact Assessment (EcIA)

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PROJECTION: British National Grid

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Path: \\UKSPRDGISFS01\Data\London\Projects\0747884 - Wombwell\Maps\0747884 - Wombwell.aprx\0747884 - Wombwell - Fig 2 - Statutory Designated Sites (2 km) - A01



Site Boundary

1 km Buffer of Site Boundary

Local Wildlife Site

0 100 200 300 400 500

Metres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: CR
PROJECT: 0747884	CHECKED: AB
DATE: 09/06/2025	APPROVED: IG

Figure 3: Non-Statutory Designated Sites
Wombwell WWTW Solar
Ecological Impact Assessment (EcIA)

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PROJECTION: British National Grid

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Site Boundary

500 m Buffer of Site Boundary

Priority Habitats Inventory

Coastal and floodplain grazing marsh

Deciduous woodland

Traditional orchard

0 50 100 150 200 250

Metres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: CR
PROJECT: 0747884	CHECKED: AB
DATE: 09/06/2025	APPROVED: IG

Figure 4: Priority Habitats
Wombwell WWTW Solar
Ecological Impact Assessment (EcIA)

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PROJECTION: British National Grid

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Path: \\UKSPRDGISFS01\Data\London\Projects\0747884 - Wombwell\Maps\0747884 - Wombwell.aprx\0747884 - Wombwell - Fig 4 - Priority Habitats (500 m) - A01



Site Boundary
Ecology Survey Area
UK Habitat Classification
c1 - Arable and Horticulture
g4 - Modified Grassland
g4, 10 - Modified Grassland; Scattered Scrub
g4, 16 - Modified Grassland; Tall Forbs
h3d - Bramble Scrub
u1b - Developed Land; Sealed Surface
u1b5 - Developed Land; Buildings
u1f - Sparsely Vegetated Urban Land
r2b - Other Rivers and Lakes

0 20 40 60 80 100
Metres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: CR
PROJECT: 0747884	CHECKED: AB
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Figure 5: Habitat Survey Results
Wombwell WWTW Solar
Ecological Impact Assessment (EcIA)

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Site Boundary

GCN Survey Area

Ponds Surveyed

Label	Name
P1	Pond 1
P2	Pond 2
P3	New Pond

0 50 100 150 200 250

Metres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: CR
PROJECT: 0747884	CHECKED: AB
DATE: 09/06/2025	APPROVED: IG

Figure 6: Pond Plan
Wombwell WWTW Solar
Ecological Impact Assessment (EcIA)

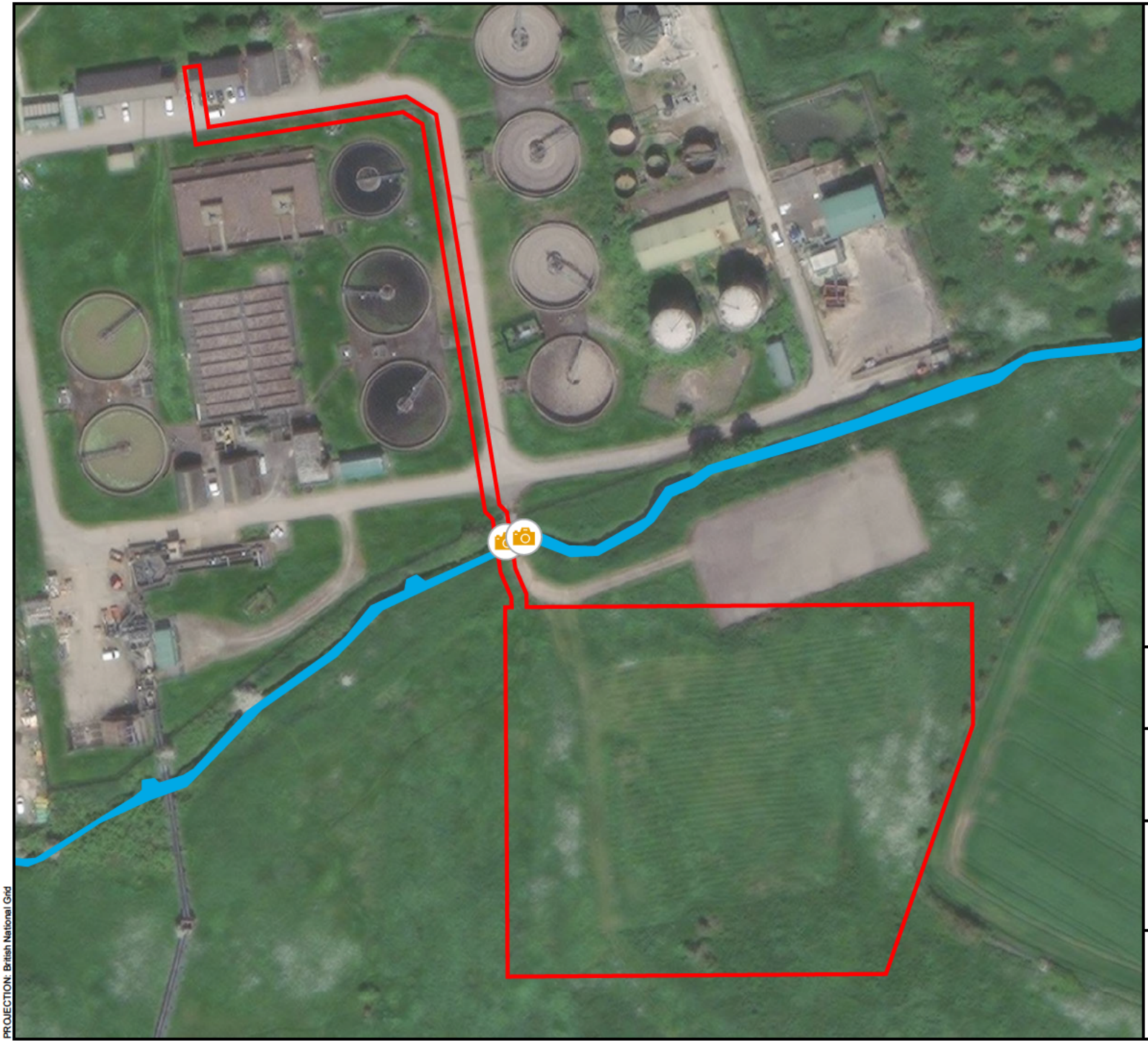
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Path: \\UKSPRDGISFS01\Data\London\Projects\0747884 - Wombwell\Maps\0747884 - Wombwell.aprx\0747884 - Wombwell - Fig 6 - Pond Plan - A01



Site Boundary

Trail Camera Location

Bulling Dike

0 10 20 30 40 50

Metres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: CR
PROJECT: 0747884	CHECKED: AB
DATE: 09/06/2025	APPROVED: IG

Figure 7: Trail Camera Location Plan
Wombwell WWTW Solar
Ecological Impact Assessment (EcIA)

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Path: \\UKSPRDGISFS01\Data\London\Projects\0747884 - Wombwell\Maps\0747884 - Wombwell.aprx\0747884 - Wombwell - Fig 7 - Trail Camera Location Plan- A01



Site Boundary

Reptile Refugia



0 5 10 15 20 25

Metres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: CR
PROJECT: 0747884	CHECKED: AB
DATE: 09/06/2025	APPROVED: IG

Figure 8: Reptile Survey Location Plan
Wombwell WWTW Solar
Ecological Impact Assessment (EcIA)

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Path: \\UKSPRDGISFS01\Data\London\Projects\0747884 - Wombwell\Maps\0747884 - Wombwell.aprx\0747884 - Wombwell - Fig 8 - Reptile Survey Location Plan - A01

APPENDIX B IMPACT ASSESSMENT GUIDANCE

B1. GEOGRAPHIC SCALES OF IMPORTANCE

Importance	Criteria
International	The population has little or no ability to absorb change without fundamentally altering its present character (i.e., the population of a rare and sensitive species in significant decline). An internationally designated site (e.g., a SAC), or a site meeting criterion for international designation. Species present in internationally important numbers (>1 % of international population).
National (England)	The population has low ability to absorb change without fundamentally altering its present character (i.e., the population of an uncommon or rare species in decline, or common species in significant decline). A nationally designated site (e.g., SSSI). Species present in nationally important numbers (> 1 % of English population).
Regional (North East)	The population has a moderate capacity to absorb change. Without significantly altering its present character (i.e., an uncommon or rare, but stable species, or a common / widespread but declining species). Species present in regionally important numbers (> 5% of the population within Yorkshire and the North East). Sites do not meet criteria for SSSI selection, but greater than the county criteria below.
County (Yorkshire)	The population has a moderate capacity to absorb change. Without significantly altering its present character (i.e., an uncommon or rare, but stable species, or a common / widespread but declining species). Species present within important numbers for the county of North Yorkshire, (i.e. > 5 % of the population in North Yorkshire). Priorities within the Local Biodiversity Action plan (LBAP) where they occur in sufficient abundance to maintain local resource. Sites meet criteria for County Wildlife Sites (CWS).
Local (Barnsley)	Sites where there is no significant connectivity to international, national, regional or county designations or a site not meeting criterion for such a designation. The population is tolerant of change without detriment to its character (a common / widespread species that is stable, or uncommon species that is improving). A species or habitat of low conservation value, but with very limited presence. Priorities within the LBAP, where they occur in low abundance. Local Wildlife Trust (LWS) sites, Local Nature Reserves (LNRs) and Sites of Importance for Nature Conservation (SINCs). Areas of habitat or species considered to appreciably enrich the ecological resource within the area local to the Site.
Less than Local (Site)	The population is resistant to change (any population that is improving its range and abundance). Population of little conservation value, or of local conservation value but with very limited presence. Usually widespread and common habitats and species. Loss of such species from the Site, would not be detrimental to the ecology of the local area.

B2. IMPACT CHARACTERISATION

In line with CIEEM guidelines[1] the assessment described the relevant characteristics required to identify potential effects:

- Beneficial or adverse: these are determined according to whether the change is in accordance with nature conservation objectives and policy. A positive impact is a change that improves the quality of the environment and may include halting or slowing an existing decline in the quality of the environment. A negative impact is a change that reduces the quality of the environment;
- Extent: a spatial or geographical area over which the impact may occur;
- Magnitude: the size, amount, intensity and volume of the impact, which should be quantified if possible (see below) and expressed in absolute or relative terms (e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population);
- Duration: this is defined in relation to ecological characteristics in addition to human timeframes. Impacts may be described as short, medium, long-term, permanent, or temporary;
- Frequency and timing: this will consider the number of times an activity will occur in a limited period that may influence the resulting impact. The timing and frequency of an activity or change may result in an impact if it coincides with seasonal ecological elements (such as protected species' breeding season); and,
- Reversibility: an irreversible impact is one from which recovery is not possible within a reasonable timescale, or there is no reasonable chance of action being taken to reverse it. A reversible impact is one from which spontaneous recovery is possible or which may be counteracted by mitigation.

Magnitude	Criteria
High	A fundamental change to the baseline condition, leading to a total loss or major alteration of baseline condition.
Medium	A material, partial loss, or alteration of baseline condition.
Low	A slight, detectable alteration of the baseline condition.
Negligible	A barely distinguishable change from baseline condition.

APPENDIX C SITE PHOTOGRAPHS



Image C-1: Tall forbs and hemlock within the southern extent of the ESA.



Image C-2: Tall forbs and willowherb within the southern extent of the ESA.



Image C-3: Scattered scrub on northern bank of Bulling Dike, looking north.



Image C-4: Extensive arable field comprising cereal crops to the east of the ESA.



Image C-5: Hardstanding of access track, looking north from Bulling Dike crossing.



Image C-6: Small mound made up of earth, rubble and gravel within area of hardstanding.



Image C-7: Bramble scrub in the southwest of the ESA.



Image C-8: Bulling Dike, looking east from bridge/access track crossing.



Image C-9: Individual quaking aspen tree to the south of the ESA.



Image C-10: Individual willow tree located to the west of ESA.

APPENDIX D GCN EDNA ANALYSIS

Folio No:	970-2025
Purchase Order:	0747 884
Contact:	Environmental Resources Management
Issue Date:	15.05.2025
Received Date:	30.04.2025

GCN Report

Technical Report

SureScreen Scientifics

Folio No: 970-2025
Purchase Order: 0747 884
Contact: Environmental Resources Management
ssue Date: 15.05.2025
Received Date: 30.04.2025

SureScreen Scientifics

GCN eDNA Analysis

Summary

When great crested newts (GCN), *Triturus cristatus* , inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analyzing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

Results

Lab ID	Site Name	OS Reference	Degradation Check	Inhibition Check	Result	Positive Replicates
GCN25 2477	Wombwell - P1	SE 41136 03664	Pass	Pass	Negative	0/12
GCN25 2479	Wombwell - P3	SE 41266 03233	Pass	Pass	Negative	0/12
GCN25 2480	Wombwell - P2	SE 41200 03633	Pass	Pass	Negative	0/12

Matters affecting result: none

Reported by: Amy Bermudez

Approved by: Lauryn Jewkes

SureScreen Scientifics

Methodology

The samples detailed above have been analyzed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample tube which then undergoes DNA extraction. The extracted sample is then analyzed using real-time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded. Analysis of eDNA requires attention to detail to prevent the risk of contamination. True positive controls, negative controls, and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added analytical security.

SureScreen Scientifics Ltd is ISO9001 accredited and participates in Natural England's proficiency testing scheme for GCN eDNA testing.

Interpretation of Results

Sample Integrity Check: When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results. Any samples which fail this test are rejected and eliminated before analysis.

Degradation Check: **Pass/Fail**. Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

Inhibition Check: **Pass/Fail.** The presence of inhibitors within a sample is assessed using a DNA marker. If inhibition is detected, samples are purified and re-analyzed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA (Positive/Negative/Inconclusive)**
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with the WC1067 Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.
Inconclusive: Controls indicate inhibition or degradation of the sample, resulting in the inability to provide conclusive evidence for GCN presence or absence.

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