Gate Burton
ENERGY PARK

Gate Burton Energy Park Environmental Statement

Volume 3: Appendix 8-K: Riparian Mammal Survey Report
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1. Introduction

1.1.1 This report on riparian mammals forms a technical appendix to the Environmental Statement (ES), specifically to accompany **ES Volume 1, Chapter 8: Ecology and Nature Conservation [EN010131/APP/3.1]**. Further information on the Scheme is included within **ES Volume 1, Chapter 2: The Scheme [EN010131/APP/3.1]**.

1.2 Report Objectives

1.2.1 The objective of the surveys for riparian mammals, reported in this document, is to determine the presence and distribution of Water Vole and Otter, within the Order Limits (herein referred to as 'the Site') and relevant zones of influence to determine any potential impacts of the Scheme on riparian mammals.

1.2.2 This report includes the following information:

- relevant legislation and policy;
- methods for desk and field-based assessments undertaken in 2021 and 2022 respectively;
- limitations to the surveys undertaken and any assumptions made as a result of incomplete data;
- survey results; and
- conclusions.

1.2.1 This report is a technical appendix to accompany **Chapter 8: Ecology and Nature Conservation** of this ES **[EN010131/APP/3.1]**.

2. Legislation and Planning Policy

2.1 Relevant legislative context

2.1.1 Water Vole and Otter are both fully protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) (Ref 2). They are afforded protection under Section 9 parts 9 (1), (2), (4) and (5) of the Act, making it an offence to:

- intentionally kill, injure or take these species;
- possess or control live or dead individuals of these species or their derivatives;
- intentionally or recklessly damage, destroy or obstruct access to any structure or place used for their shelter or protection;
- intentionally or recklessly disturb these species whilst occupying a structure or place of shelter used for that purpose;
- sell these species or offer or expose for sale or transport for sale; and
- publish or cause to be published any advertisement which conveys the buying or selling of these species.

2.1.2 Otter is also classified under the Habitats Directive (92/43/EEC) (Ref 3) as a species requiring strict protection in Europe. In the UK this is enabled by The Conservation of Habitats and Species Regulations 2017 (as amended) (Ref 4). Otter is also included in the following international legislation / conventions:

- Appendix II and IV of the Habitats Directive, Appendix II of the Bern Convention (Ref 5) and Appendix I of CITES (Ref 6); and
- globally threatened on the IUCN/WCMC Red Data List (Ref 7).

2.2 Natural England licencing

2.2.1 A licence is required from Natural England to intentionally damage or destroy burrows or displace Water Voles from their burrows for lawful development. Any operations that may impact upon Otters or their places of rest or shelter will require a Natural England European Protected Species (EPS) licence. There is no provision for licencing development or other construction activities under the Wildlife and Countryside Act. Such works should therefore be undertaken under a conservation licence. This licence requires demonstration of a conservation benefit for Water Vole and Otter and this benefit can be achieved by delivering a net gain in the amount of habitat available to the Water Vole and Otter population.

2.3 Priority species

2.3.1 The Natural Environment and Rural Communities (NERC) list of Species of Principal Importance (Ref 8) is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act (Ref 8); under Section 40 every public authority (*e.g.* a local authority or local planning authority) must, in exercising

its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.

2.3.2 In addition, with regard to those species on the list of Species of Principal Importance listed under Section 41 (S41), the Secretary of State must:

"*(a) take such steps as appear to the Secretary of State to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section, or*

(b) promote the taking by others of such steps."

2.3.3 The UK Biodiversity Action Plan (UKBAP) (Ref 9) was launched in 1994 and established a framework and criteria for identifying species of conservation concern. From this list, action plans for priority species of conservation concern were published and have subsequently been succeeded by the UK Post-2010 Biodiversity Framework (July 2012) (Ref 10). The UK Post 2010 Development Framework is relevant in the context of Section 40 of the NERC Act, meaning that Priority Species are material considerations in planning. These species are identified as those of conservation concern due to their rarity or a declining population trend.

2.3.4 Water Vole and Otter are included as a priority species under Section 41 of the NERC Act (Ref 8).

2.4 Local biodiversity action plan

2.4.1 The Scheme is located within two counties: Lincolnshire and Nottinghamshire. The Lincolnshire Biodiversity Action Plan (3rd edition) (Ref 11) and Nottinghamshire Biodiversity Action Plan (Ref 12) provide the local nature conservation strategy for identifying threats to species within each of the counties and set out the action plans necessary to conserve them. These action plans provide context to inform identification of threatened or uncommon species within the district and, or county. The plans also identify priorities for conservation and enhancement but confers no particular legislative or policy protection to the species identified, however in some cases this is provided through related legislation and local planning policy.

2.4.2 Water Vole is listed as a Priority Species on the Lincolnshire Biodiversity Action Plan (Ref 11) and the Nottinghamshire Biodiversity Action Plan (Ref 12), with species action plans prepared within both counties.

2.4.3 Both the Lincolnshire Biodiversity Action Plan (Ref 11) and Nottinghamshire Biodiversity Action Plan (Ref 12) identify the following threats to Water Vole populations:

- damage to (and loss of) habitat due to insensitive routine maintenance of channel and bankside vegetation and the engineering of watercourses;
- developments within the floodplain can result in the direct loss of Water Vole habitat;

- Fluctuations in water level due to land drainage, flood control, irrigation schemes and drought. Water Voles create access holes to their burrows based on water levels during the active summer months and when water levels are lowered in the winter, burrow entrances can be left exposed and vulnerable to predation;
- Population fragmentation leaves colonies remote from their neighbours. Colonies isolated by lack of continuity of habitat are more at risk of local extinctions with no chance of repopulation;
- Predation, particularly by American Mink *Mustela vison* and domestic cats;
- Pollution of the aquatic environment by contaminants discharged from industry, agriculture and urban waste treatment; and
- Persecution through the improper use of rodenticides.

2.4.4 Otter is listed as a Priority Species on the Nottinghamshire Biodiversity Action Plan (Ref 12), which identifies the following threats to Otter populations in Nottinghamshire:

- Historical land drainage and flood defence work, which has resulted in the extensive loss of habitat. In particular, the removal of scrub and overhanging trees has made many long stretches of watercourse unsuitable for Otters;
- Poor water quality and unsympathetic land management along some watercourses, leading to poor populations of prey species such as fish and crayfish;
- Disturbance. Although Otters are reasonably tolerant, recolonisation of breeding sites may not occur where disturbance is high. Dogs are a particular problem, and for this reason Mink hunting may be potentially damaging; and
- The trapping of Mink, and the use of fyke nets to catch Eels *Anguilla anguilla*. Otters get caught in both types of trap, and Otter guards on fyke nets are required by the Environment Agency.

3. Methods

3.1 Desk study

3.1.1 A desk study was undertaken as part of the Preliminary Ecological Appraisal (PEA) in October 2021 (see **Appendix 8-B** of **Chapter 8: Ecology and Nature Conservation** of this ES **[EN010131/APP/3.3]**). This desk study obtained records of Water Vole and Otter within the preceding ten years and within a 2km radius of the Site from the Greater Lincolnshire Nature Partnership (GLNP) and Nottinghamshire Biological and Geological Records Centre (NBGRC).

3.1.2 Only records up to ten years old were considered within the assessment, as any records older than ten years are unlikely to be still representative of either species' presence in the local area.

3.2 Field survey

Survey Area

3.2.1 Aerial photographs and information gathered during the PEA survey (Ref 13) was used to identify riparian and wetland habitats within an appropriate buffer (up to 10m) either side of the Solar and Energy Storage Park and this information was used to refine the survey area for riparian mammals. Therefore, the survey area included any water bodies within the Site and watercourses within and, or, connected to the Solar and Energy Storage Park (up to 10m).

3.2.2 Within the Grid Connection Corridor, all water bodies and watercourses (including upstream and downstream of watercourses), to a maximum of 10m where access was permitted were surveyed. However, for Otter the survey area along the River Trent, this was extended to 100m upstream and downstream (where access permitted) and included terrestrial habitats (such as woodland) where Otter holts and resting places may be present.

Habitat Suitability Assessment

3.2.3 A walkover of the survey area (see section 3.2.1) was undertaken by an experienced surveyor in May 2022 to undertake a habitat suitability assessment for Water Vole and Otter. Forty watercourses and a single water body were identified within the survey area.

3.2.4 Watercourses and water bodies that were identified during the habitat suitability assessment as being dry; were heavily shaded; were in heavy agricultural use with no marginal vegetation; or where there were significant barriers to movement between the water body or watercourse and the Site, were considered as being of negligible suitability for Otter and Water Vole and were scoped out from further survey. This assessment was made with reference to the criteria presented in Table 1.

Table 1: Summary of riparian mammal habitat suitability assessment criteria

Otter	Water Vole
• proximity to the Site; • presence of barriers to dispersal and movement through the territory; • habitats present and suitability for use by Otter (including terrestrial habitats); • adjoining land use; • level of disturbance; • features of watercourse or water body (estimated depth, level of flow, width of channel); • connectivity with other areas of suitable or sub-optimal habitat; and • pollution.	• rate of water flow; • bank profile; • degree of shading from overhanging trees or scrub; • extent of suitable emergent and bankside herbaceous vegetation for shelter, food and nesting material; • levels of site disturbance (e.g. proximity to public rights of way, farm vehicle access tracks or road traffic); • potential for the water body or watercourse to dry out; • suitability of bank substrates for burrowing; and • pollution and water quality.

Water Vole Survey

3.2.5 Water Voles typically inhabit slow-moving streams, canals, ditches, dykes and rivers, feeding mostly on waterside vegetation. They are active in daylight hours and leave several indications of their presence and these signs can be used to identify the presence of Water Vole.

3.2.6 The Water Vole survey involved identification of evidence of Water Vole activity up to 5m from the bank of the surveyed watercourses and waterbody. Field surveys were based on the standard methodologies as described by Strachan *et al*. (2011) (Ref 14) and Dean *et al.* (2016) (Ref 15). Field signs searched for included:

- latrine sites – distinct piles of Water Vole droppings found near burrows, at the ranges of territorial boundaries and where the animals enter and leave the water;
- feeding stations – areas with distinct neat piles of chewed lengths of vegetation along pathways or haul out platforms along the water's edge;
- burrows – burrow entrances are typically wider than high with a diameter between 4 and 8cm. Burrow entrances are generally located at the water's edge;
- lawns – short grazed areas at the entrances to burrows;
- prints – identifiable prints in soft margins of the watercourse; and
- runways – low tunnels that are pushed through the vegetation and often leading to burrows or feeding stations.

3.2.7 In accordance with the guidance set out in Water Vole Mitigation Handbook (Ref 15), one survey was conducted in the first half of the breeding season (April to June) and a second survey was carried out in the second half of the breeding season (July to September). All surveys were undertaken during suitable weather conditions and by experienced AECOM ecologists.

3.2.8 Any information gathered during the survey on Water Vole signs were used to calculate and estimate Water Vole population and, or activity within those specific waterbodies or watercourses. The presence or absence of American Mink and Brown Rat *Rattus norvegicus* was also recorded if the species or signs of their presence were noted.

3.2.9 It is not possible to make robust estimates of the number of Water Voles from latrine counts, but latrines do provide an indication of activity suitable for assessment of impacts and designing mitigation (Ref 15).

Otter survey

3.2.10 The aim of the survey was to determine the presence or absence of Otter on those waterbodies and watercourses deemed suitable for Otter following the habitat suitability assessment. The methodology used was in accordance with guidance in the New Rivers and Wildlife Handbook (RSPB, NRA & RSNC, 1994) (Ref 16); the Environment Agency's Fifth Otter Survey of England 2009-2010 Ref 17) and '*Monitoring the Otter'* (Ref 18).

3.2.11 Otter surveys can be carried out at any time of year, though the period May to September is optimal when water levels are less variable. Surveys were not undertaken following periods of heavy rain and, or, high-water levels as it can obscure or remove signs of Otter and result in false negative survey results. Ideally, there should be a period of at least five days without rain before surveying. Therefore, surveys were undertaken during appropriate weather conditions for survey.

3.2.12 Due to the low likelihood of making an actual observation of Otter, the survey concentrated on locating field signs indicating Otter presence or use within the survey area. Such field signs include:

- spraints (droppings) – characteristic sweet-smelling, black tar-like (where fresh/relatively recent *i.e*. within a few weeks) or grey crumbly (when old) faecal deposits usually containing fish scales, bones and occasionally invertebrate exoskeleton and bird feathers;
- footprints – in good substrate typically asymmetrical and showing five toes arched around a large pad and, depending on substrate, webbing and claw marks. Poorer, generally coarser substrates do not often enable the identification of Otter footprints. Additional signs of Otter presence may occur, although without additional evidence is not usually conclusive proof of current Otter presence;
- feeding remains – feeding remains may include partially eaten fish, frogs, piles of mussel shells or crayfish remains;
- slides/ haul-outs – routes into and out of the water, which are usually associated with terrestrial routes such as short cuts around meanders or along traditionally used otter paths/routes;
- couches/ hovers – above ground resting places. Usually associated with cover such as dense scrub, rushes or reed, flood debris or fallen trees. Many couches are rarely used whilst others more so. Difficult to prove use without radio tracking; and

- holts – below ground resting site, usually associated with sprainting. Sometimes used with greater frequency than couches and can be important for breeding (natal holts) where other signs are usually absent. Notoriously difficult to find or prove without radio tracking.

3.3 Biodiversity Evaluation

3.3.1 An essential prerequisite step to allow ecological impact assessment of the Scheme was an evaluation of the relative biodiversity importance of the identified ecological features (encompassing nature conservation designations, ecosystems, habitat and species). This was necessary to set the terms of reference for the subsequent ecological impact assessment.

3.3.2 The method of evaluation that was utilised has been developed with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) (Ref 19). This gives guidance on scoping and carrying out environmental assessments and places appraisal in the context of relevant policies. Data received through consultation, desk study and field-based surveys were used to identify ecological features of biodiversity importance or potential importance, and the main factors contributing to their importance described and related to available guidance.

3.3.3 Species can be of biodiversity importance for a variety of reasons, and their relative importance should always be determined on a case-by-case basis. Importance may relate, for example, to the uniqueness of the assemblage, or to the extent to which species are threatened throughout their range, or to their rate of decline.

3.3.4 The importance of the species addressed in this report has been defined with reference to the geographical level at which the feature being assessed is considered to matter. Relevant published national and local guidance and criteria can be used, where available, to inform the assessment of biodiversity importance and to assist consistency in evaluation. Current population and conservation status for Water Vole and Otter has been taken from "*A Review of the Population and Conservation Status of British Mammals*" (Ref 20).

3.4 Assumptions and limitations

Desk study

3.4.1 The aim of a desk study was to help characterise the baseline context of the Scheme and provide valuable background information that would not be captured by a single site survey alone. Information obtained during the course of a desk study was dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for riparian mammals does not necessarily mean that this species does not occur in the study area. Likewise, the presence of records of riparian mammals does not automatically mean that these still occurred within the area of interest or were relevant in the context of the Scheme.

Field Survey

3.4.2 Watercourses 23, 38, 38a and 39 were only surveyed once in spring 2022, rather than the recommended two surveys. However, these watercourses are within the Grid Connection Corridor and included within the avoidance areas for construction, therefore there will be no impacts to watercourses and in turn, riparian mammals (if present).

3.4.3 Furthermore, some watercourses included within the survey area but within the 'avoidance areas' of the Grid Connection Corridor, were surveyed twice during 2022, but surveyed using 'spot-check' methods of checking the most suitable habitat within the watercourse for signs of riparian mammals, rather than walking the entire lengths of both banks of each watercourse. However, there will be no impacts to such watercourses and in turn, riparian mammals (if present).

3.4.4 Throughout this report a precautionary approach, of assuming presence of riparian mammals, has been taken where habitat quality is considered as optimal for riparian mammals to occur and where surveys were not undertaken in full (as described above). Therefore, a single survey on four watercourses and spot-checks on others within the Grid Connection Corridor is not considered a limitation on the efficacy of the survey.

4. Results

4.1 Desk study

Water Vole

4.1.1 A number of records of Water Vole were returned from the data search, within 2km of the Site and from within the last ten years. The GLNP data search identified records from drains and watercourses to the east of Knaith Park and associated with the Solar and Energy Storage Park. Further records were identified from within watercourses within the Grid Connection Corridor. The NBGRC data search returned 57 records of Water Vole from within 2km of the Site, including records within watercourses within or adjacent to the Grid Connection Corridor.

Otter

4.1.2 Four records of Otter were returned from GLNP, the most recent being from 2014 and all four records were associated with the River Trent.

4.1.3 The NBGRC data search returned two records of Otter, both associated with the River Trent corridor and outside of the Site boundary.

4.2 Field survey

Habitat Suitability Assessment

4.2.1 The habitat suitability assessment was undertaken on 40 watercourses and a single water body within the survey area. This survey was used to further refine the scope of surveys and determine whether they were suitable (*i.e* scoped in for further survey) or unsuitable (*i.e.* scoped out of further survey) for riparian mammals.

4.2.2 The majority of watercourses within the Solar and Energy Storage Park will be avoided by the Scheme and will have suitable buffer zones (of a minimum of 10m from the centre-line of the watercourse) from Scheme infrastructure. Therefore, only the most suitable watercourses to support either species were recommended for further survey in this area, to provide an indication on presence or absence of this species and where potential impacts (through watercourse crossing points) were identified.

4.2.3 The majority of watercourses within the Grid Connection Corridor are proposed to be crossed during construction through horizontal directional-drilling (HDD) methods, *i.e.* avoiding direct impacts to the watercourse (see **Appendix 2-B: Figure 1 [EN010131/APP/3.3]**). Therefore, where these methods are adopted, those watercourses within the Grid Connection Corridor would not be impacted upon. However, watercourses that were deemed suitable to support Water Vole or Otter during the habitat suitability assessment (see Table 1), or where data search records indicated potential

presence of either species, were recommended for further survey to determine presence or absence of either species to inform on appropriate construction methods, should these be deemed necessary to change.

4.2.4 A summary of the 40 watercourses surveyed during the habitat suitability assessment and whether these were scoped in (and recommended survey effort) or scoped out, is presented in Table 2.

Table 2: Summary of riparian mammal habitat suitability assessment criteria

Watercourse reference (see Figure 8-K1)	Scheme Area	Summary of habitat suitability survey	Scheme Impacts predicted?	Scoped in for further survey?
1	Solar and Energy Storage Park	Roadside ditch with limited connectivity to other more suitable watercourses / barriers to dispersal, adjacent to busy road, dry. Little to no herbaceous vegetation suitable for riparian mammals.	Widening of the existing culvert (of up to 2m) but no infrastructure within 10m	No – unsuitable for riparian mammals and retained / avoided
2	Solar and Energy Storage Park	Connected to off-site watercourses, herbaceous vegetation and suitable bank profiles.	No, boundary feature that will be retained and avoided (>10m)	This watercourse will be retained / avoided with suitable buffers to protect riparian habitats and measures put in place to prevent indirect impacts (such as pollution control) into watercourses. Therefore, riparian mammals (if present) will not be impacted upon either directly or indirectly. However, owing to desk study records from this area, a precautionary survey was recommended to inform on presence / absence.
3	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side.	No, retention and avoidance – no access tracks crossing watercourse or infrastructure within 10m	This watercourse will be retained / avoided with suitable buffers to protect riparian habitats and measures put in place to prevent indirect impacts (such as pollution control) into watercourses. Therefore, riparian mammals (if present) will not be impacted upon either directly or indirectly. However, owing to desk study records from this area, a precautionary survey was

Watercourse reference (see Figure 8-K1)	Scheme Area	Summary of habitat suitability survey	Scheme Impacts predicted?	Scoped in for further survey?
				recommended to inform on presence / absence.
4	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side.	No, boundary feature that will be retained and avoided (>10m)	No – retained / avoided with suitable buffers to protect riparian habitats and measures will be put in place to prevent indirect impacts (such as pollution control) into watercourses. Therefore, riparian mammals (if present) will not be impacted upon either directly or indirectly.
5	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation and hedgerow. Arable land (therefore disturbed) either side.	Crossing proposed via a new culvert	No – unsuitable for riparian mammals
6	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation and hedgerow. Arable land (therefore disturbed) either side.	No, retention and avoidance and no infrastructure within 10m	No – unsuitable for riparian mammals
7	Solar and Energy Storage Park	Mostly unsuitable, as dry or heavily shaded through boundary vegetation, but small sections are more suitable. Water Vole latrines recorded during the Phase 1 survey.	Majority of watercourse retained, although crossing point may be required, but no infrastructure within 10m	Yes (spot-checks) within most suitable sections of ditch as Water Vole present.
8	Solar and Energy Storage Park	Wider channel but most of northern section is overshaded by trees and hedge. Southern section is dry with limited herbaceous vegetation and heavily shaded through bankside vegetation. Arable land (therefore disturbed) either side.	No, retention and avoidance – no access tracks crossing watercourse or infrastructure within 10m	No – unsuitable for riparian mammals and retained / avoided
9	Solar and Energy Storage Park	Mostly dry (water depth c.20cm) and heavily shaded from bankside vegetation, limited herbaceous	Access over watercourse will utilise existing access track at the northern end which will be	The majority of this watercourse will be retained / avoided with suitable buffers to protect riparian

Watercourse reference (see Figure 8-K1)	Scheme Area	Summary of habitat suitability survey	Scheme Impacts predicted?	Scoped in for further survey?
		vegetation. Arable land (therefore disturbed) either side	widened (up to 2 m) but no infrastructure within 10m	habitats and measures put in place to prevent indirect impacts (such as pollution control) into watercourses. However, owing to desk study records from this area and the proposed widening of the culvert, a precautionary survey was recommended to inform on presence / absence.
10	Solar and Energy Storage Park	Dry ditch and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	Access over watercourse will be via a new culver but no infrastructure within 10m	The majority of this watercourse will be retained / avoided with suitable buffers to protect riparian habitats and measures put in place to prevent indirect impacts (such as pollution control) into watercourses. However, owing to desk study records from this area and a proposed new crossing point, a precautionary survey was recommended to inform on presence / absence.
11	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	Majority of watercourse retained and avoided although an access point over watercourse will require a new culvert and an existing crossing point will be widened (up to 2m). No infrastructure within 10m of the watercourse	No – unsuitable for riparian mammals

Watercourse reference (see Figure 8-K1)	Scheme Area	Summary of habitat suitability survey	Scheme Impacts predicted?	Scoped in for further survey?
12	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	Majority of watercourse retained and avoided although an access point over watercourse will require a new culvert. No infrastructure within 10m of the watercourse	No – unsuitable for riparian mammals
13	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	Access over watercourse will utilise existing access track with widening of the existing culvert (of up to 2m) but no infrastructure within 10m	No – unsuitable for riparian mammals and retained / avoided
14	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	No, retention and avoidance – no access tracks crossing watercourse or infrastructure within 10m	No – unsuitable for riparian mammals and retained / avoided
15	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	No, retention and avoidance – access over watercourse will utilise existing access track and no infrastructure within 10m	No – unsuitable for riparian mammals and retained / avoided
16	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	Majority of watercourse retained and avoided – crossing proposed via a new culvert over watercourse but no infrastructure within 10m	No – unsuitable for riparian mammals
17	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	No, retention and avoidance – no access tracks crossing watercourse or infrastructure within 10m	No – unsuitable for riparian mammals and retained / avoided

Watercourse reference (see Figure 8-K1)	Scheme Area	Summary of habitat suitability survey	Scheme Impacts predicted?	Scoped in for further survey?
18	Solar and Energy Storage Park	Wide channel, limited flow, connected to off-site watercourses. Curled Pondweed *Potamogeton crispus* seen in a number of places.	No, retention and avoidance – no access tracks crossing watercourse or infrastructure within 10m	Suitable to support Water Vole and Otter, therefore, precautionary survey to determine presence or absence. However, retained / avoided with suitable buffers to protect riparian habitats and measures will be put in place to prevent indirect impacts (such as pollution control) into watercourses. Therefore, riparian mammals (if present) will not be impacted upon either directly or indirectly.
19	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	No, retention and avoidance – no access tracks crossing watercourse or infrastructure within 10m	No – unsuitable for riparian mammals and retained / avoided
20	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation and hedgerow. Arable land (therefore disturbed) either side.	No, retention and avoidance – access over watercourse will utilise existing access track and no infrastructure within 10m	No – unsuitable for riparian mammals and retained / avoided
21	Solar and Energy Storage Park	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	No, retention and avoidance – access over watercourse will utilise existing access track and no infrastructure within 10m	No – unsuitable for riparian mammals and retained / avoided
22	Grid Connection Corridor	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation.	No, retention and avoidance	No – retained / avoided

Watercourse reference (see Figure 8-K1)	Scheme Area	Summary of habitat suitability survey	Scheme Impacts predicted?	Scoped in for further survey?
23	Grid Connection Corridor	Wide channel connected to the River Trent. Steep-sided banks but good habitat.	No, the grid connection crossing will utilise HDD construction methods and will avoid potential impacts to this watercourse. Any temporary access tracks will be over the watercourse without the need to directly impact upon this watercourse.	Desk study records from this watercourse, therefore a precautionary spot-check survey (owing to steep-side banks and Health and Safety implications), although this watercourse will be retained and avoided (with setbacks of 10m from the centre-line of the watercourse).
24	Grid Connection Corridor	River Trent	No, the grid connection crossing will utilise HDD construction methods and will avoid potential impacts to the River Trent.	Yes, for Otter which could be present in surrounding habitat
25	Grid Connection Corridor	Ditch, connected to other watercourses which is very floristically rich including a *Chara* sp.	No, the grid connection crossing will utilise HDD construction methods and will avoid potential impacts to this watercourse. Any temporary access tracks will be over the watercourse without the need to directly impact upon this watercourse.	A precautionary survey, owing to desk study records, although this watercourse will be retained and avoided (with setbacks of 10m from the centre-line of the watercourse).
26	Grid Connection Corridor	Small water filled ditch (connected to other watercourses) with good habitat.	No, the grid connection crossing will utilise HDD construction methods and will avoid potential impacts to this watercourse. Any temporary access tracks will be over the watercourse without the need	A precautionary survey, although this watercourse will be retained and avoided (with setbacks of 10m from the centre-line of the watercourse).

Watercourse reference (see Figure 8-K1)	Scheme Area	Summary of habitat suitability survey	Scheme Impacts predicted?	Scoped in for further survey?
			to directly impact upon this watercourse.	
27	Grid Connection Corridor	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	Yes – crossing this watercourse (if required) may involve intrusive (open trench) methods.	Yes - survey to determine presence / absence
28	Grid Connection Corridor	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	Yes – crossing this watercourse may involve intrusive (open trench) methods.	Yes - survey to determine presence / absence
30	Grid Connection Corridor	Ditch, connected to other watercourses. Steep-sided banks but good quality habitat.	No, the grid connection crossing will utilise HDD construction methods and will avoid potential impacts to this watercourse. Any temporary access tracks will be over the watercourse without the need to directly impact upon this watercourse.	A precautionary survey, although this watercourse will be retained and avoided (with setbacks of 10m from the centre-line of the watercourse).
31	Grid Connection Corridor	Ditch, connected to other watercourses	No, the grid connection crossing will utilise HDD construction methods and will avoid potential impacts to this watercourse. Any temporary access tracks will be over the watercourse without the need to directly impact upon this watercourse.	A precautionary survey, although this watercourse will be retained and avoided (with setbacks of 10m from the centre-line of the watercourse).

Watercourse reference (see Figure 8-K1)	Scheme Area	Summary of habitat suitability survey	Scheme Impacts predicted?	Scoped in for further survey?
33	Grid Connection Corridor	Cow Pasture Lane Drains LWS. Very shallow water in some sections. Bankside vegetation lack herbaceous plants.	No, the grid connection crossing will utilise HDD construction methods and will avoid potential impacts to this LWS. There are no access points and no construction traffic crossing this watercourse.	A precautionary survey, although this watercourse will be retained and avoided (with setbacks of 10m from the centre-line of the watercourse).
33a	Grid Connection Corridor	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	Yes – crossing this watercourse may involve intrusive (open trench) methods.	Yes - survey to determine presence / absence
34	Grid Connection Corridor	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	Yes – crossing this watercourse may involve intrusive (open trench) methods.	Yes - survey to determine presence / absence
35	Grid Connection Corridor	Dry, little to no aquatic vegetation or bankside cover. Arable land (therefore disturbed) either side	No, the grid connection crossing will utilise HDD construction methods and will avoid potential impacts to this watercourse. Any temporary access tracks will be over the watercourse without the need to directly impact upon this watercourse.	A precautionary survey, although this watercourse will be retained and avoided (with setbacks of 10m from the centre-line of the watercourse).
36	Grid Connection Corridor	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	No, the grid connection crossing will utilise HDD construction methods and will avoid potential impacts to this watercourse. Any temporary	A precautionary survey, although this watercourse will be retained and avoided (with setbacks of 10m from the centre-line of the watercourse).

Watercourse reference (see Figure 8-K1)	Scheme Area	Summary of habitat suitability survey	Scheme Impacts predicted?	Scoped in for further survey?
			access tracks will be over the watercourse without the need to directly impact upon this watercourse.	
37	Grid Connection Corridor	Dry and heavily shaded from bankside vegetation, limited herbaceous vegetation. Arable land (therefore disturbed) either side	Yes – crossing this watercourse (if required) may involve intrusive (open trench) methods.	Yes - survey to determine presence / absence
38	Grid Connection Corridor	In sections, ditch heavily shaded although some sections offer potentially suitable riparian habitat for Water Vole.	No, the grid connection crossing will utilise HDD construction methods and will avoid potential impacts to this watercourse.	A precautionary survey, although this watercourse will be retained and avoided (with setbacks of 10m from the centre-line of the watercourse).
38a	Grid Connection Corridor	Dry and unsuitable for riparian mammals	Unlikely	No – unsuitable for riparian mammals
39	Grid Connection Corridor	Mostly heavily shaded, but eastern section holds water and is more open, with connectivity to off-site watercourses	No, if required in this area, the grid connection crossing will utilise HDD construction methods and will avoid potential impacts to this watercourse.	A precautionary survey to inform presence / absence, although no impacts are predicted
40	Grid Connection Corridor	Holds water but heavily shaded in sections, due to hedgerow on south side. Managed and vegetation along the banks cut in autumn.	No, this watercourse is on the south side of an existing track and will not be crossed	A precautionary survey to inform presence / absence, although no impacts are predicted

Riparian Mammal Survey

4.2.5 Twenty-six watercourses and one water body (see Figure 8-K1) were scoped in for further survey during the habitat suitability assessment survey (see Table 2), to determine presence, or absence of either Water Vole or Otter. A summary of the results of these surveys are presented in in Table 3.

4.2.6 No evidence of American Mink was recorded anywhere within the Site.

Table 3: Summary of riparian mammal habitat suitability assessment criteria

Scheme Area	Watercourse reference (see Figure 8K-1)	Survey Date(s)	Summary of Results	Water Vole Present or Absent?	Otter Present or Absent?
Solar and Energy Storage Park	2	7th -10th June 2022 23rd August 2022	No evidence of either species, but desk study records of Water Vole	Desk study records, although the field survey did not record evidence of this species	Absent
Solar and Energy Storage Park	3	7th -10th June 2022 6th September 2022	No evidence of either species, but desk study records of Water Vole	Desk study records, although the field survey did not record evidence of this species	Absent
Solar and Energy Storage Park	7	7th -10th June 2022 23rd August 2022	Water Vole latrines recorded around culvert	Present, evidence recorded during field survey	Absent
Solar and Energy Storage Park	8	7th -10th June 2022 6th September 2022	Heavily overgrown / shaded by bankside vegetation and dry in September 2022. No evidence of either species	Absent	Absent
Solar and Energy Storage Park	9	7th -10th June 2022 6th September 2022	No evidence of either species, but desk study records of Water Vole	Desk study records, although the field survey did not record evidence of this species	Absent
Solar and Energy Storage Park	10	7th -10th June 2022 6th September 2022	No evidence of either species, but desk study records of Water Vole	Desk study records, although the field survey did not record evidence of this species	Absent
Solar and Energy Storage Park	18	7th -10th June 2022 7th September 2022	Water Vole feeding remains in June 2022. In September 2022, banks recently mown and managed.	Present, evidence recorded during field survey	Absent

Scheme Area	Watercourse reference (see Figure 8K-1)	Survey Date(s)	Summary of Results	Water Vole Present or Absent?	Otter Present or Absent?
Grid Connection Corridor	22	7th -10th June 2022	No evidence of either species, but desk study records of Water Vole	Present, inferred from desk study records, although the field survey did not record evidence of this species	Absent
Grid Connection Corridor	23	7th -10th June 2022	No evidence of either species, but desk study records of Water Vole	Present, inferred from desk study records, although the field survey did not record evidence of this species	Absent
Grid Connection Corridor	24	12th May 2022 25th August 2022	Otter footprints along muddy margins of eastern bank	Absent	Present
Grid Connection Corridor	25	7th -10th June 2022 25th August 2022	No evidence of either species, but desk study records of Water Vole	Present, inferred from desk study records, although the field survey did not record evidence of this species	Absent
Grid Connection Corridor	26	7th -10th June 2022 25th August 2022	Ditch heavily overgrown, but dry. No evidence of either species	Absent	Absent
Grid Connection Corridor	27	7th -10th June 2022 25th August 2022	Ditch heavily overgrown, but dry. No evidence of either species	Absent	Absent
Grid Connection Corridor	28	7th -10th June 2022 25th August 2022	Ditch heavily overgrown, but dry. No evidence of either species	Absent	Absent
Grid Connection Corridor	30	7th -10th June 2022 25th August 2022	No evidence of either species	Absent	Absent

Scheme Area	Watercourse reference (see Figure 8K-1)	Survey Date(s)	Summary of Results	Water Vole Present or Absent?	Otter Present or Absent?
Grid Connection Corridor	31	7th -10th June 2022 25th August 2022	No evidence of either species	Absent	Absent
Grid Connection Corridor	33	7th -10th June 2022 26th August 2022	Majority (90%) of ditch dry. No evidence of either species	Absent	Absent
Grid Connection Corridor	33a	7th -10th June 2022 26th August 2022	Ditch dry. No evidence of either species	Absent	Absent
Grid Connection Corridor	34	7th -10th June 2022 26th August 2022	Ditch dry. No evidence of either species	Absent	Absent
Grid Connection Corridor	35	7th -10th June 2022 26th August 2022	Ditch dry. No evidence of either species	Absent	Absent
Grid Connection Corridor	36	7th -10th June 2022 26th August 2022	Ditch dry. No evidence of either species	Absent	Absent
Grid Connection Corridor	37	7th -10th June 2022 26th August 2022	Ditch dry. No evidence of either species	Absent	Absent
Grid Connection Corridor	38	22nd June 2022	No evidence of either species	Absent	Absent
Grid Connection Corridor	38a	22nd June 2022	Ditch dry. No evidence of either species	Absent	Absent

Scheme Area	Watercourse reference (see Figure 8K-1)	Survey Date(s)	Summary of Results	Water Vole Present or Absent?	Otter Present or Absent?
Grid Connection Corridor	39	22nd June 2022	No evidence of either species	Absent	Absent
Grid Connection Corridor	40	7th -10th June 2022 7th September 2022	No evidence of either species	Absent	Absent

5. Evaluation

5.1.1 Limited observations of Water Vole were made within the Site, with evidence recorded during field surveys from two watercourses (7 and 18) within the Solar and Energy Storage Park. The data search returned records (from within the last ten years) from four watercourses (2, 3, 9 and 10), however, no evidence of Water Vole was recorded from these watercourses during field surveys and it is therefore likely that Water Vole is now absent from within these four watercourses.

5.1.2 Within the Grid Connection Corridor, no evidence of Water Vole was recorded in any watercourses during field surveys. However, the data search identified the presence of this species from three watercourses (22, 23 and 25) within the Grid Connection Corridor and from within the last ten years. Whilst no evidence of Water Vole was recorded within these watercourses during field surveys, owing to the field methods adopted within these areas (using spot-check methods) and without survey along the entire lengths of these watercourses, as a precaution, presence of this species has been assumed.

5.1.3 Whilst Water Vole is restricted in its distribution across the Site, in consideration of this species' declining status in a national and county context, the population of Water Vole is potentially of District importance.

5.1.4 Otter was found to use the River Trent, with footprints recorded along the banks of the river. No holts, couches or resting sites were recorded. Otter has an estimated British population of 11,000 (Ref 20), with an increasing population size and range and are of IUCN Least Concern Status in England. The Site is assessed as of Local Importance for Otter as a species of conservation value in a local context (within approximately 2km of the Site).

5.2 Potential Impacts

5.2.1 The primary purpose of this report is to provide an assessment of the presence or likely absence of Water Vole and Otter and their biodiversity importance within the Scheme to inform **Chapter 8: Ecology and Nature Conservation** of this ES **[EN010131/APP/3.1]**. An assessment of potential impacts (considering embedded mitigation), any additional mitigation and residual effects has been undertaken and included within **Chapter 8: Ecology and Nature Conservation** of this ES **[EN010131/APP/3.1]**.

5.2.2 In summary, the Scheme has embedded sufficient mitigation and avoidance measures to ensure that the majority of watercourses within the Site are avoided and retained. Watercourses supporting Water Vole within the Solar and Energy Storage Park (7 and 18) will be retained, suitably buffered and any crossing points over watercourse 7 will use existing crossing points or a bailey bridge to avoid physical disturbance to the watercourse. The majority of watercourses within the Grid Connection Corridor will be avoided and none of

the watercourses where intrusive (trenching) methods are proposed were found to support Water Vole or Otter.

5.2.3 However, pre-commencement checks will be required in advance of construction to ensure that the distribution of Otter and Water Vole remain the same and that any mitigation proposed is appropriate.

6. Conclusions

6.1.1 The riparian mammal surveys, undertaken in 2022 recorded both Otter and Water Vole within the Site. Otter and Water Vole are both fully protected under Schedule 5 of the Wildlife & Countryside Act 1981 (Ref 2).

6.1.2 Impacts to both species will be avoided, however, any impacts upon riparian mammals, arising as a result of construction of the Scheme, are considered to have a potentially significant adverse impact. Potential impacts upon riparian mammals include those arising from direct effects (such as loss of habitat) and indirect effects (such as disturbance, pollution effecting watercourses).

6.1.3 Through the avoidance of watercourses and appropriate buffers from the banks, of no less than 10m from the centre-line of the watercourse, with the implementation of a mitigation strategy, formalised through a Construction and Environment Management Plan (CEMP), the potential for deliberate harm and injury to Otter and Water Vole will be avoided. Mitigation is required to:

- ensure compliance with relevant legislation; and
- avoid impacts that would give rise to a potential “significant effect”, therefore contrary to planning policy and biodiversity obligations of the NERC Act (Ref 8).

6.1.4 A significant negative effect is one which undermines nature conservation objectives or changes the conservation status of a species population.

7. References

Ref 1. HMSO (2008) The Planning Act 2008. Available at: https://www.legislation.gov.uk/ukpga/2008/29/pdfs/ukpga_20080029_en.pdf

Ref 2. HMSO. (1981). Wildlife & Countryside Act 1981 (as amended).

Ref 3. EC (1992). Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. EC, Brussels

Ref 4. HMSO (2018). Conservation of Habitats and Species Regulations 2017 (as amended). HMSO, London.

Ref 5. Anon, 2001. Appendices of the Convention and Amendments to the Appendices. Bern Convention. Council of Europe.

Ref 6. Anon, 2020. Appendices I, II and III. CITES

Ref 7. IUCN, 2020. The IUCN Red List of Threatened Species.

Ref 8. HMSO (2006). The Natural Environment and Rural Communities Act. HMSO, London

Ref 9. JNCC (1994). UK Biodiversity Action Plan

Ref 10. UK Post-2010 Biodiversity Framework (2012). Joint Nature Conservation Committee and Department for Environment, Food and Rural Affairs.

Ref 11. Lincolnshire Biodiversity Action Plan. (2012-2020) 3rd edition. Available at: .http://www.southkesteven.gov.uk/CHttpHandler.ashx?id=7371&p=0 .

Ref 12. Nottinghamshire Biodiversity Action Group (2008). Local Biodiversity Action Plan.

Ref 13. AECOM (2022) Gate Burton Energy Park: Preliminary Ecological Appraisal

Ref 14. Strachan, R, Moorhouse, Y & Gelling, M. 2011. The Water Vole Conservation Handbook (Third Edition).

Ref 15. Dean, M., Strachan, R., Gow, D. and Andrews, R. 2016. The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.

Ref 16. Holmes, N., Ward, D. and Jose, P. 2001 The New Rivers and Wildlife Handbook. RSPB.

Ref 17. Environment Agency, (2010). Fifth Otter Survey of England 2009-2010. Technical Report. Environment Agency.

Ref 18. Chanin, P., 2003. Ecology of European Otter, Conserving Natura 2000 Rivers. Ecology. Series No.10 English Nature.

Ref 19. Chartered Institute of Ecology and Environmental Management (CIEEM) (2018), Guidelines for Ecological Impact Assessment in the United Kingdom: Terrestrial, Freshwater, Coastal and Marine.

Ref 20. Mathews, F., Kubasiewicz, L. M., Gurnell, J., Harrower, C. A., McDonald, R. A. and Shore, R. F. 2018. Natural England Joint Publication JP025: A Review of the Population and Conservation Status of British Mammals. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage.

Figures

Figure 8K-1 Surveyed watercourses and distibution of riparian mammals across the Site

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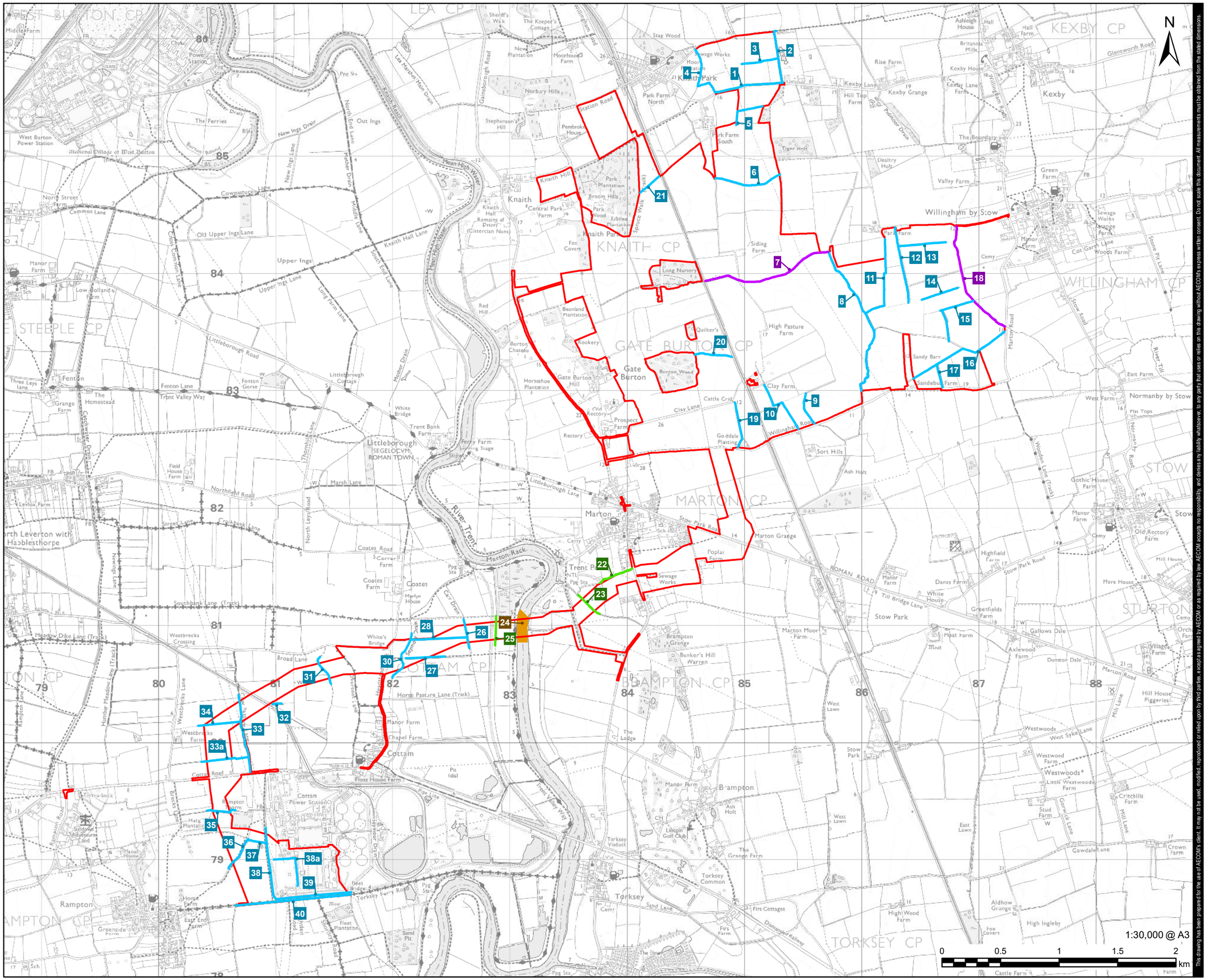

AECOM

PROJECT

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LEGEND

- Order Limits
- Otter Presence from Field Surveys
- Water Vole Presence from Desk Study Records
- Water Vole Presence from Field Surveys
- Other Watercourse Surveyed for Riparian Mammals

NOTES

ISSUE PURPOSE

Environmental Statement

PROJECT NUMBER

60664324

FIGURE TITLE

Watercourses Surveyed for signs of Water Vole and Otter Activity

FIGURE NUMBER

Figure 8K.1