



ENVIRONMENTAL STATEMENT: 6.3 APPENDIX 7-8: TERRESTRIAL INVERTEBRATES SURVEY REPORT

Cory Decarbonisation Project

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EXECUTIVE SUMMARY

WSP UK Ltd was commissioned by Cory Environmental Holdings Ltd (the 'Applicant') to complete a invertebrate survey for the Proposed Scheme.

The requirement for a terrestrial invertebrate assessment followed the identification of suitable habitats with the potential to support important assemblages of invertebrates within the Scheme. These habitats were identified within the Preliminary Ecological Appraisal (PEA) Report (**Appendix 7-2: Preliminary Ecological Appraisal (Volume 3)**). This report comprises an Invertebrate Habitat Potential (IHP) assessment across the Site Boundary.

The Survey Area shown in **Figure 7-19: Terrestrial Invertebrate Survey Area (Volume 2)** was assessed for its potential to support important terrestrial invertebrate assemblages by a suitably experienced ecologist, on 07 August 2023. The survey effort was focused on habitats and habitats features that were most likely to be directly impacted by the Proposed Scheme (e.g., through direct habitat loss).

An IHP assessment was undertaken across the Site Boundary. The IHP assessment concluded that the Habitat Elements (as detailed in **Table 3-1** of this appendix) best represented across the Site are as follows:

- Survey Area 1 HE3 Nectar Resources ('B' grading);
- Survey Area 2 HE2 Rotational Management, HE4 Wet Substrates, HE5 Open Water Habitats, HE9 Connectivity and HE10 Ecoclines ('C' grading); and
- Survey Area 3 HE3 Nectar Resources, HE4 Wet Substrates, HE5 Open Water Habitats, HE10 Ecoclines ('B' grading).

Some of the habitats across the Site are likely to contribute to the regional importance of the Crossness LNR, as there is some good connectivity between similar habitat types present.



1. INTRODUCTION

1.1. BACKGROUND

- 1.1.1. WSP UK Ltd has been commissioned to undertake an invertebrate survey of the land at Riverside Resource Recovery Ltd T/A Cory Riverside Energy, Norman Road North, Lower Belvedere, London, DA17 6JY (centred on National Grid reference: TQ 4967 8066 and extending to ~62.ha), hereafter referred to as the 'Site'.
- 1.1.2. The requirement for a terrestrial invertebrate assessment followed the identification of suitable habitats with the potential to support important assemblages of invertebrates within the Proposed Scheme. These habitats were identified within the PEA Report (Appendix 7-2: Preliminary Ecological Appraisal (Volume 3)). This report comprises an Invertebrate Habitat Potential (IHP) assessment across the Site Boundary.

1.2. BRIEF AND OBJECTIVES

- 1.2.1. WSP UK Ltd was commissioned by Cory Environmental Holdings Limited (Cory) to undertake a terrestrial invertebrates assessment, with the following objectives:
 - to undertake a desk study to determine the number and type of invertebrate species records within the Study Area (2km radius of the Site Boundary);
 - identify the key habitats/features within the Survey Area that are likely to be of the greatest value to terrestrial invertebrates; and
 - record incidental terrestrial invertebrate species (if present) within the Survey Area in August 2023.

1.3. STUDY AND SURVEY AREAS

STUDY AREA

1.3.1. An ecological desk study was completed in January 2023. As part of this study, records of any notable or legally protected species from within the Study Area were requested from Greenspace Information for Greater London (GiGL). The Study Area for this was defined as a 2km radius of the Site Boundary, shown in **Figure 7-19:**Terrestrial Invertebrate Survey Area (Volume 2).

SURVEY AREAS

1.3.2. The assessment covered three Survey Areas (hereafter referred to as collectively 'Survey Area') within the Site Boundary of the Scheme. The habitats and habitat features within each Survey Area were assessed for their potential to support an important terrestrial invertebrate assemblage. The Survey Areas are shown in **Figure 7-19**: **Terrestrial Invertebrate Survey Area (Volume 2)**.



2. LEGAL AND POLICY COMPLIANCE

2.1.1. All relevant legal and planning policies are detailed within **Section 7.2** of **Chapter 7: Terrestrial Biodiversity (Volume 1)**.



3. METHODS

3.1. DESK STUDY

- 3.1.1. A desk based review of existing biological information was undertaken across the Study Area which utilised the following information sources:
 - Multi Agency Geographic Information for the Countryside (MAGIC)¹;
 - Ordnance Survey mapping and publicly available aerial photography²; and
 - A data search report from GiGL³ in January 2023 that included recent and historic invertebrate records within 2km.
- 3.1.2. In addition, a terrestrial invertebrate survey report prepared by Colin Plant Associates (2021)⁴ was reviewed for its data pertaining to the adjacent Crossness LNR.

3.2. FIELD SURVEY

INVERTEBRATE HABITAT POTENTIAL (IHP) ASSESSMENT

- 3.2.1. The Survey Area shown in **Figure 7-19: Terrestrial Invertebrate Survey Area** (**Volume 2**) was assessed for its potential to support important terrestrial invertebrate assemblages by a suitably experienced ecologist, on 07 August 2023. Survey effort was focussed on habitats and habitats features that were most likely to be directly impacted by the Proposed Scheme (e.g. through direct habitat loss).
- 3.2.2. To enable a baseline characterisation of these habitats for invertebrates, an IHP assessment was undertaken with reference to standard survey and assessment methodologies outlined in Brooks, 1993⁵; Drake et al., 2007⁶ and English Nature, 2005⁷. A record was made regarding the habitats present and features considered likely to be of significant value or potentially valuable for notable invertebrate assemblages. Such features can include areas with dense patches of flowering plants (including on roadside verges); south facing banks; patchy mosaic habitat including aggregations of bare ground; margins of scrub/woodland and substrate containing high organic content; mature or veteran trees offering standing and fallen dead wood and temporary areas of standing water (e.g., ephemeral pools and seepages) and associated terrestrial habitat (e.g. marshy grassland).
- 3.2.3. **Table 3-1** and **Table 3-2** show details of the IHP assessment protocol^{7,8}.



Table 3-1: Summary of Eleven Habitat Elements Assessed by IHP Survey

Habitat Element	No.	Comments
Decaying Wood	HE1	In all its forms; from decaying wood on/in large trees to woodland floor debris.
Rotational Management	HE2	Planned or serendipitous; and whether for nature conservation of other purposes.
Nectar Resources	HE3	As a proxy for nectar and for pollen resources, as assessment of pollen resources is impracticable on a walk-through survey.
Wet Substrates	HE4	Including marginal, marshy, muddy and seasonally inundated habitats, as well as flushes.
Open Water Habitats	HE5	The open water element of rivers, lakes, ponds, streams, ditches etc.
Structural Patchwork	HE6	Habitat mosaics, including, but by no means restricted to open mosaic habitats on previously developed land.
Still Air (S)	HE7	Suntraps and still air microclimates in open situations. The term 'still air' is used in preference to 'wind breaks' as many rigid wind breaks are likely to produce turbulent air in their lee.
Still Air (H)	HE8	Humid still air microclimates in sheltered and shaded situations.
Connectivity	HE9	Landscape-scale connectivity between the Site and external habitats.
Ecoclines	HE10	A graded transition between two or more broad habitats.
Bare Earth	HE11	Unshaded bare or sparsely vegetated well-drained substrate, regardless of soil type.



Table 3-2: Grading System Applied to Habitat Elements

Grade	Description
Exceptional (A)	Very high quality examples of the habitat element, including but not restricted to those of potential regional significance. This may be for reasons of intrinsic quality, rarity, vulnerability, or the perceived importance of its position in the wider landscape.
Major (B)	Good quality examples of each habitat element which do not meet the criteria for Exceptional. Likely to be a predominant factor in supporting characteristic and specialised invertebrate assemblages. Considerations might include the extent, maturity and historic and current connectivity of the element.
Minor (D)	Habitat element is present but is insufficient quality to qualify as Moderate or above. For example, it may be of extremely limited extent, or very sparsely dispersed. Likely to support common and widespread, generalist species.
Moderate (C)	A clear example of the habitat element is present, but which does not qualify as Major. Likely to be of sufficient quality to support a characteristic invertebrate fauna.
Negligible/Absent (E)	Habitat element is absent or of insignificant (barely perceptible) quantity.

3.2.4. To enable a baseline characterisation of the Survey Area for invertebrates, the habitat assessment included observations of features that might limit invertebrate interest, as well as those which might be of value for invertebrates.

INCIDENTAL RECORDINGS FOR TERRESTRIAL INVERTEBRATES

- 3.2.5. During the assessment on 7th August 2023, incidental recordings of invertebrate species were noted e.g. butterflies and dayflying moths, etc.
- 3.2.6. In addition to this, and where time allowed, the assessment was supplemented with sweep-netting and a small number of pan traps at each of the survey parcels. However, a full targeted sampling survey was not undertaken in this instance.

3.3. NOTES AND LIMITATIONS

3.3.1. This assessment is based on a single survey visit in August 2023, which is an optimal time for habitat assessment for terrestrial invertebrates. However, the species list is limited as only incidental species observed on the day were recorded. No surveys in other months took place in 2023.



4. RESULTS

4.1. DESK STUDY

- 4.1.1. GiGL returned multiple records of invertebrate species for groups including Lepidoptera (butterflies and moths), Hymenoptera (ants, bees, wasps and sawflies), Coleoptera (beetles), Diptera (true flies) and Odonata (dragonflies and damselflies). Many of these include species that are assigned conservation statuses, i.e. Red List species, species listed in Annex 2 of the Habitats Directive or Section 41 Priority Species. A complete list of invertebrate desk study records provided by GiGL is included in **Annex A**.
- 4.1.2. A terrestrial invertebrates survey report prepared by Colin Plant Associates (2021⁹) for the adjacent Crossness LNR has compiled a dataset which had produced records of "several hundred terrestrial invertebrate species". The report describes the Crossness LNR and Norman Road Field (see **Figure 1-2: Satellite Imagery of the Site Boundary Plan (Volume 2)**) as being "of regional importance for invertebrates on the basis of its wetland fauna, as well as those associated with areas of short sward grassland and bare ground". The Crossness LNR supports "a large and diverse overall invertebrate assemblage", with 718 species recorded.

4.2. FIELD SURVEY

INVERTEBRATE HABITAT POTENTIAL (IHP) ASSESSMENT Site Habitat Descriptions

4.2.1. The Survey Area is comprised of land to the east of Crossness Water Treatment Works and Crossness LNR and to the west of an Iron Mountain Records Storage Facility. The River Thames forms the northern boundary and the A2016 the southern boundary (see **Figure 1-1: Site Boundary Plan (Volume 2)**) road habitat types within the Site include grazing pasture (identified as "Coastal and floodplain grazing marsh" Priority Habitat within MAGIC¹, hardstanding, buildings, grassland, reedbeds, ditches, ponds, scrub and woodland.



Survey Area 1

- 4.2.2. Survey Area 1 covers the northern section of the Site, to the north of the Riverside 1 facility and bordering the England Coast Path (FP3/NCN1). Most of the habitat here is classed as 'other neutral grassland' from the UKHab walkover and generally supports a diverse mix of flowering plants (compared with the modified grassland areas of the site). These flowering plants provide a rich nectar and pollen resource for a range of insect pollinators. There are patches of scrub along the fence of the northern border in Survey Area 1, a ditch and reedbed on the eastern edge and some young trees near the entrance to Riverside 1 and Riverside 2 on the southern edge of Survey Area 1. The scrub is composed of bramble Rubus fruticosus agg., which would provide pollen and nectar in June and July, but also includes species such as teasel *Dipsacus* fullonum and spear thistle Cirsium vulgare. The grassland was composed of a mix of flowering plants, particularly those of the *Apiaceae* and *Asteraceae* families, such as yarrow Achillea millefolium, wild carrot Daucus carota, as well as Lady's Bedstraw Galium verum and lucerne Medicago sativa. The grassland is managed by mowing, likely once a year.
- 4.2.3. A ditch is present along the boundary of Survey Area 1, which may support some wetter habitat species (the ditch contains water for part of the year but likely dries up during the warmer periods of summer). Riverside 1 offers some shelter from the wind and much of the area receives ample sunlight during the day. However, the proximity of the Riverside 1 building creates a lot of shade over the grassland. Nevertheless, during the survey a range of solitary bees, flies, wasps and grasshoppers were recorded within Survey Area 1. This habitat description is summarised in terms of IHP categories below in **Table 4-1** and is accompanied by photographs of the habitats and habitat features of note (**Annex B**).

Table 4-1: Survey Area 1, IHP Assessment Results

Habitat Element		HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11
IHP Grading	Е	D	В	D	D	D	D	D	С	D	D

Survey Area 2

4.2.4. Survey Area 2 is situated immediately south of Riverside 1 and Riverside 2 and comprises East Paddock, an over-grazed paddocks with horses. This habitat has been categorised as coastal and floodplain grazing marsh with reedbeds, scrub and ditches, most of which are located along the site boundary. The grassland is generally species-poor and overgrazed. Plant species recorded in this location include red bartsia *Odontites verna*, which dominated large swathes of the grassland as well as thistle *Cirsium* sp., bramble and hawthorn. Other species included: creeping bent *Agrostis stolonifera*, cock's-foot *Dactylis glomerata*, nipplewort *Lapsana communis*, dock *Rumex* sp., perennial rye grass *Lolium perenne*, common bent *Agrostis capillaris*, daisy *Bellis perennis*, cranesbill *Geranium* sp., common nettle *Urtica dioica*, creeping cinquefoil *Potentilla reptans* and red fescue *Festuca rubra*.



4.2.5. Areas of open bare ground were present where the horses had been grazing but was limited in its extent. There is limited shade in this area, due to a lack of trees and little shelter from the wind. This habitat description is summarised in terms of IHP categories below in **Table 4-2** and is accompanied by photographs of the habitats and habitat features of note (**Annex B**).

Table 4-2: Survey Area 2, IHP Assessment Results

Habitat Element		HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11
IHP Grading	D	С	D	С	С	D	С	D	С	С	D

Survey Area 3

- 4.2.6. Survey Area 3 is the largest area assessed, comprising Crossness LNR and Norman Road Field, with habitats including: coastal and floodplain grazing marsh, reedbeds, bramble scrub, grassland (modified), ditches, a large pond and woodland.
- 4.2.7. Survey Area 3 supports long grass and a range of wildflowers, providing food and shelter for different invertebrate species. The northern edge of the woodland offers some shelter, and still air, but also plentiful shade. The survey recorded common and widespread species from the following groups: bees, wasps, hoverflies, crickets, grasshoppers and spiders. The grassland shows few signs of management, apart from a mown paths through the vegetation, and at the time of survey mostly left ungrazed. Some ditches in this area contained water and looked suitable to support species of *Odonata*, along with the large pond, with some common and widespread species observed on the day of survey. The ditches and reedbeds provide open water and wet substrate habitats. There are some small patches of bare earth in the central portion of this area, that may be suitable for nesting *Hymenoptera*. This habitat description is summarised in terms of IHP categories below in **Table 4-3** and is accompanied by photographs of the habitats and habitat features of note (**Annex B**).

Table 4-3: Survey Area 3, IHP Assessment Results

Habitat Element		HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11
IHP Grading	С	С	В	В	В	D	С	С	С	В	С

INCIDENTAL RECORDINGS OF TERRESTRIAL INVERTEBRATES

4.2.9. During the IHP assessments for each Survey Area, observations were made on invertebrate species present at the time of each walkover. The species recorded include those from the following groups, but not limited to; *Coleoptera* (beetles), *Lepidoptera* (butterflies and moths) and *Hemiptera* (true bugs).



5. CONCLUSION

- 5.1.1. An IHP assessment was undertaken across the Site Boundary. The IHP assessment concluded that the Habitat Elements (as detailed in **Table 3-1** of this appendix) best represented across the Site are as follows:
 - Survey Area 1 HE3 Nectar Resources ('B' grading);
 - Survey Area 2 HE2 Rotational Management, HE4 Wet Substrates, HE5 Open Water Habitats, HE9 Connectivity and HE10 Ecoclines ('C' grading); and
 - Survey Area 3 HE3 Nectar Resources, HE4 Wet Substrates, HE5 Open Water Habitats, HE10 Ecoclines ('B' grading).
- 5.1.2. Some of the habitats across the Survey Areas are likely to contribute to the regional importance of the Crossness LNR adjacent to the Site, as there is some good connectivity and similar types of habitat present.



Annex A

DESK STUDY RECORDS WITHIN 2KM



Table A-1: Terrestrial Invertebrate Desk Study Records within 2km

Species	Taxon Group	No. of Records	Designation
Lasiommata megera Wall Brown	Insect – butterfly (<i>Lepidoptera</i>)	4	S41 PS LPS LSOCC IUCN (2001) NT
Bombus humilis Brown-banded carder bee	Insect – bumblebee (Hymenoptera)	12	S41 PS LPS LSOCC
Lycaena phlaeas eleus Small Copper	Insect – butterfly (Lepido <i>ptera</i>)	50	LPS
Ochlodes sylvanus Large Skipper	Insect – butterfly (Lepido <i>ptera</i>)	122	LPS
Tyria jacobaeae Cinnabar Moth	Insect – moth (<i>Lepidoptera</i>)	75	S41 PS
Euplagia quadripunctaria Jersey Tiger	Insect – moth (<i>Lepidoptera</i>)	44	Hab&Spp Dir Anx 2
Thymelicus lineola Essex Skipper	Insect – butterfly (<i>Lepidoptera</i>)	51	LPS
Thymelicus sylvestris Small Skipper	Insect – butterfly (<i>Lepidoptera</i>)	89	LPS
Bombus sylvarum Shrill carder bee	Insect – bumblebee (<i>Hymenoptera</i>)	11	S41 PS LPS LSOCC Nationally Notable B
Sympetrum striolatum Common darter	Insect – dragonfly (<i>Odonata</i>)	100	IUCN (2001) DD
Chiasmia clathrate Latticed Heath	Insect – moth (<i>Lepidoptera</i>)	1	S41 PS LPS LSOCC



Species	Taxon Group	No. of Records	Designation
Dorycera graminum Picture-winged fly	Insect – true fly (<i>Diptera</i>)	3	S41 PS LPS IUCN (2001) NT
Lycaena phlaeas Small American Copper	Insect – butterfly (<i>Lepidoptera</i>)	32	LPS
Arctia caja Garden tiger moth	Insect – moth (<i>Lepidoptera</i>)	2	S41 PS LPS LSOCC
Scotopteryx chenopodiata Shaded Broad-bar	Insect – moth (<i>Lepidoptera</i>)	1	S41 PS
Coenonympha pamphilus Small Heath	Insect – butterfly (<i>Lepidoptera</i>)	26	S41 PS LPS LSOCC IUCN (2001) NT
Hydrophilus piceus Great silver water beetle	Insect – beetle (Coleoptera)	1	IUCN (2001) NT
Bombus rupestris Red-tailed cuckoo bumblebee	Insect – bumblebee (<i>Hymenoptera</i>)	1	Nationally Notable B LSOCC
Lasioglossum angusticeps Cliff Furrow Bee	Insect – bee (<i>Hymenoptera</i>)	2	S41 PS LSOCC
Chrysis fulgida Ruby tailed wasp	Insect – wasp (<i>Hymenoptera</i>)	3	S41 PS LSOCC
Lucanus cervus European Stag Beetle NS = Nationally Scarce	Insect – beetle (Coleoptera)	115	Hab&Spp Dir Anx 2 S41 PS LPS

NS = Nationally Scarce,

Nb = Nationally Scarce B Category

S41 PS = Section 41 Priority Species (NERC Act) IUCN (2001)

DD = Data Deficient, IUCN (2001)

NT = Near Threatened, IUCN (2001)



Species	Taxon Group	No. of Records	Designation				
VU = Vulnerable							
Hab&Spp Dir Anx 2 = Habitats Directive Annex 2 – priority species							
LPS = London Priority Species							
LSOCC = London Species of Conservation Concern							



Annex B

SURVEY PHOTOGRAPHS



SURVEY PHOTOGRAPHS



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 Grass bank along northern boundary in Area 1, facing east



© Chris Horley

2. Grass bank along northern boundary in Area 1, facing west



© Chris Horley

3. Pan trap in-situ in Area 1



© Chris Horley

4. Reedbed in Area 1



© Chris Horley

7. Horse-grazed grassland in Area 2

8. Red bartsia in Area 2





© Chris Horley



© Chris Horley

9. Long-grass and scrub in Area 2



© Chris Horley

10. Bare ground in Area 2



© Chris Horley

11. Area of reedbed and pond habitat in Area3



© Chris Horley

12. Bare ground and horses in Area 3



© Chris Horley

13. Grassland in Area 3

14. Long grass / mown path in grassland in Area 3



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