

(HWUP): Tottenham Substation

Preliminary Ecological Appraisal Report

National Grid

July 2023

PDD-101786-203722-REP-203

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This document has 45 pages including the cover.

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Contents

Chapter	Page
Summary	4
1. Introduction	6
Terms of Reference	6
The Site	6
Background	6
The Proposed Scheme	7
Scope of the Assessment	8
2. Methods	9
Field Survey	10
Limitations	11
3. Results	13
Statutory and Non-statutory Designated Sites	13
Irreplaceable/Priority habitats	14
Protected and Priority Animal Species	15
Invasive Non-native Species	19
4. Constraints and Recommendations	20
Key Constraints	20
Design Stage Recommendations	20
Opportunities for Ecological Enhancements and Biodiversity Net Gain	25
5. Conclusion	26
Report Validity	26
Appendices	27
Appendix A. Site Location and Proposed Scheme Drawings	28
Appendix B. Habitat Survey Plan and Target Notes	31
Target Notes	32
Appendix C. Site plant species list	35
Appendix D. Legislation Table	37
Tables	
Table 3-1 - Statutory and non-statutory designated sites for nature conservation within 1 km and 500 m respectively of the Site	13
Table 3-2 - Habitat types within the Survey Area	15
Table B-1 - Summary of target notes	32
Table C-1 – Plant species list for the Site	35
Figures	
Figure A-1 - Site Location Plan	28
Figure A-2 - Scheme Drawing - PDD-101786-203722-LAY-200-REV - 0 (3)	29
Figure A-3 - Tottenham Marshes SINC	30
Figure B-1 - Habitat Survey Plan	31

Summary

Report purpose	The aims of this report are to: - Identify key ecological constraints to the development; - Identify if additional ecological surveys are required to inform an ecological impact assessment; and, - Identify avoidance, mitigation, compensation and enhancement measures.
Proposed Scheme	Reinforcement of the electricity transmission network in London is required due to the increase in interconnector capacity. NG assets works are at Tottenham substation as identified in the HWUP scheme. The HWUP scheme involves the uprating of the overhead line (OHL) route between Pelham and Hackney substations, with works located at Rye House, Waltham Cross, Brimsdown, and Tottenham substations. The Proposed Scheme includes: - Existing 275kV ZBC route (from Waltham Cross Substation in Epping Forest, through Enfield, to Tottenham Substation in Haringey) uprating to 400kV; and - Works to existing overhead lines in and around Tottenham substation. To connect the routes together they will need to cross the existing overhead line which crosses Tottenham Marshes to the east and onwards to Redbridge substation. The safest way to achieve this crossover is to put one of the overhead lines underground using cable. This option will likely require: - The construction of two new pylons within the Lee Valley Regional Park; - The construction of two cable termination compounds in the Lee Valley Regional Park; - The relocation of a pylon on the Tottenham to Redbridge overhead line; and, - Undergrounding a section of the overhead line, connecting it to the other section of overhead line. It is understood the Proposed Scheme forms part of an existing Development Consent Order.
Desk studies and field surveys	- A desk-study undertaken during 01/05/2023; and - A walkover survey of accessible land within and adjacent to the Site on 03/05/2023.
Ecological features	During the desk study three statutory designated sites were identified within 1 km of the Site: Lea Valley Special Protection Area (SPA) and Ramsar site, and Walthamstow Reservoirs Site of Special Scientific Interest (SSSI). Six non-statutory designated sites were identified within 500 m of the Site: Lea Valley Sites of Importance for Nature Conservation (SINC), Tottenham Marshes SINC, Banbury Reservoir SINC, Tottenham Marshes East SINC, Tottenham Hale to Northumberland Park Railsides SINC and Marsh Lane Allotments SINC. Eight parcels of deciduous woodland were identified within 500 m of the Site. The data search, desk study and walkover survey has identified protected and priority species that occur or could potentially occur on Site including bats (roosting, foraging and commuting); badger, breeding birds and widespread species of reptile. The Proposed Scheme could potentially affect the ecological features and protected and priority species identified within the zone of influence, e.g. removal of vegetation could adversely affect and impact upon habitats potentially used by bats, badger, breeding birds and widespread reptiles.
Avoidance, mitigation and compensation measures	Detailed recommendations are provided in Section 4 of this report. The commitments and requirements of the Development Consent Order (DCO) should be reviewed. Any relevant DCO requirements should be met prior to construction. Habitat Regulations Assessment (HRA) – the Proposed Scheme is within

	230 m of Lee Valley Ramsar site and SPA and Walthamstow Reservoir SSSI. The Environmental Statement for the NLRP concluded that there would be no significant effect on the Ramsar and SPA. However, it is recommended that this conclusion is re-assessed to take into account any updated working areas, construction techniques (particularly in relation to anticipated noise) and updated information regarding birds using the designated sites. Therefore, HRA screening report /scoping may be required (dependent upon DCO) be undertaken to see if the Proposed Scheme is likely to cause significant effects on the integrity of these European sites. Natural England Assent – the Proposed Scheme is within 230 m of Walthamstow Reservoir SSSI. Therefore, an assent for the Proposed Scheme works may need to be obtained from Natural England. There is potential for habitats within the designated site to be affected e.g. by pollution incidents therefore strict adherence to pollution prevention in general measures below is recommended.
Recommendations for further survey	See Section 4 of this report for detailed recommendations. Advance ecological surveys are recommended prior to construction and to understand the impact of the Proposed Scheme and inform mitigation requirements. Ecological surveys are seasonally constrained, and these time-critical surveys should be taken into account in the project programme. It is recommended all available ecological survey information for the site is requested from WSP to avoid duplication of survey effort (e.g. from surveys being undertaken for other projects at the Site). Depending on the extent of vegetation clearance and existing available survey information, the following surveys may be required in advance of construction: • Bat roost assessment of trees; • Breeding birds; • Widespread species of reptile; • Badger; and • Invasive non-native plant species.
Opportunities for biodiversity enhancements and biodiversity net gain	It is understood that the client National Grid has made a commitment to a 10% Biodiversity Net Gain (BNG). Atkins have not been commissioned to assess this Scheme for BNG. Therefore, further surveys and assessments will be necessary if a calculation of BNG is required. It is suggested that should any removal of any woody material or trimming of tree branches be required that arisings be used to create log piles as invertebrate habitat (e.g. due to potential presence of priority invertebrates).

Report Validity

In the event of scope or programme changes or if works do not commence within 12 months of the date of this report then updates to the surveys may be required to ensure the validity of the data, as per CIEEM guidance¹.

¹ CIEEM (2019) *Advice Note on the Lifespan of Ecological Reports and Surveys*.

1. Introduction

Terms of Reference

- 1.1. Atkins Limited was commissioned by NG to undertake a preliminary ecological appraisal (PEA) in connection with the proposed removal of existing 275kV electrical infrastructure and installation of new 400kV electrical infrastructure at Tottenham Substation (hereafter referred to as the Proposed Scheme). The Proposed Scheme is within and surrounding Tottenham Substation, Watermead Way, Tottenham, N17 0QJ, as shown on Figure A-1 in Appendix A (hereafter referred to as the Site).
- 1.2. This report has been undertaken with reference to current good practice and provides an initial appraisal of any likely ecological constraints upon designated sites, protected species and other features of ecological interest.
- 1.3. Following the principles of the mitigation hierarchy and British Standard (BS) 42020:2013, this report also identifies the need for measures to avoid, mitigate or compensate for damage and disturbance to habitats and species. Opportunities to provide biodiversity enhancements in accordance with local, regional and national biodiversity planning strategies are also identified where relevant. Furthermore, it identifies recommendations for further ecological surveys that may be required to establish the presence or likely absence of ecological features within and adjoining the Proposed Scheme.
- 1.4. This report is intended to inform design development, site layout and/or site investigations. In addition, it provides the indicative scope for further ecological surveys or ecological impact assessment required in connection with a planning application or to contribute to an Environmental Impact Assessment.

The Site

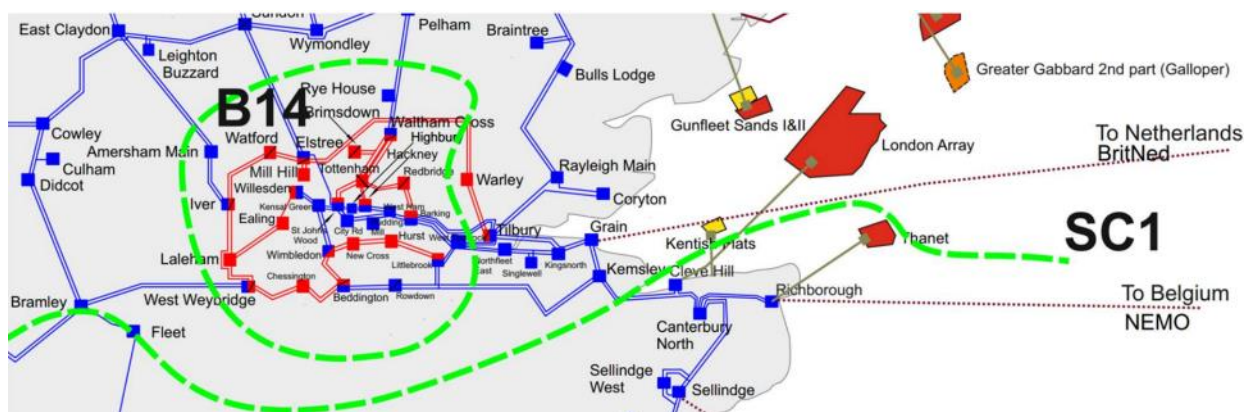
- 1.5. The Site is centred at Ordnance Survey national grid reference (OSNGR) TQ 35272 91250, and is immediately west of Pymme's Brook, which is part of Tottenham Marshes (located within the Lee Valley Regional Park), see Figure A-1 in Appendix A.
- 1.6. The Site comprises the operational electricity substation site and surrounding non-operational land. The operational site within the Site boundary security fence consists of electricity plant and equipment including transformers, gantries, power lines, and other equipment mounted on hardstanding and/or gravels.

Background

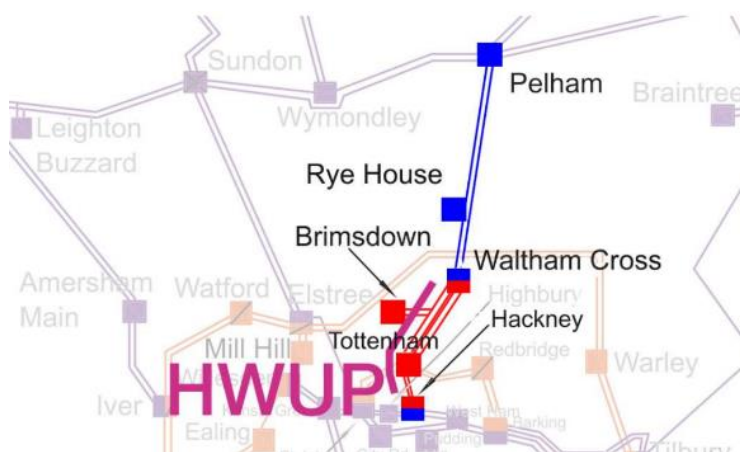
- 1.7. The Proposed Scheme forms part of the wider Hackney to Waltham Cross Upgrading (HWUP) scheme. The following is taken from the Atkins Proposal for the D4.3-Hackney Waltham Cross Upgrading-101786²:

"Reinforcement of the transmission network in London is required due to the increase in interconnector capacity (10GW) connecting south of transmission boundary SC1 (shown in plan below).

² Atkins Proposal SN0263277-HWUP-4.3-PRO-0001-Rev1 Atkins 29 July 2022



Part of the North London Reinforcement Project (NLRP)³ is the uprating of the Hackney - Tottenham – Waltham Cross 275kV to 400kV (HWUP.) The Development Consent Order (DCO) for the uprating of the 275kV circuit of Brimsdown – Tottenham – Waltham Cross (shown below) was awarded in 2014.



Upgrade and extension works are now required to deliver the HWUP scheme, completed by December 2027, including:

- New 400kV substation at Waltham Cross
- Uprate 275kV Brimsdown – Tottenham – Waltham Cross route circuits to 400kV
- Uprate 275kV Hackney – Tottenham route circuits to 400kV
- Install two new Super Grid Transformers (SGTs) at Hackney substation
- Install two new Quadrature Boosters at Pelham substation
- Refurbish 275kV Brimsdown – Tottenham – Waltham Cross route circuits

Additionally, there is a requirement to install two Mechanically Switched Capacitors (MSCs) at Pelham substation. These works are planned for completion earlier than installation of the Quad Boosters.”

The Proposed Scheme

- 1.8. The following is taken from the Construction Design Specification (CDS):
- 1.9. ‘Currently the ZBC (Waltham Cross to Tottenham substations) and VC (Tottenham to Hackney substations) overhead line routes both connect in to the existing 275kV Tottenham substation.
- 1.10. In order to uprate these lines and complete the proposed 400kV connection between Waltham Cross Substation and Hackney Substation these lines need to be connected together and ‘bypass’ the substation at Tottenham which will continue to operate a 275kV.

³ The National Grid (North London Reinforcement Project) Order | 2014 (planninginspectorate.gov.uk)

- 1.11. *To connect the ZBC and VC routes together, new infrastructure will need to be constructed to the east of the existing substation within the Tottenham Marshes area. Also to connect the routes together they will need to cross the existing overhead line which crosses Tottenham Marshes to the east and onwards to Redbridge substation. The safest way to achieve this crossover is to put one of the overhead lines underground using cable. This option will likely require:*
- *The construction of two new pylons within the Lee Valley Regional Park;*
 - *The construction of two cable termination compounds in the Lee Valley Regional Park;*
 - *The relocation of a pylon on the Tottenham to Redbridge overhead line; and,*
 - *Undergrounding a section of the ZBC overhead line, connecting it to the VC overhead line. Twelve High Voltage (HV) underground cables and other earthing/control cables will be run from the southern sealing end compound to the northern sealing end compounds. They will run from the southern sealing end compound via the southern cable bridge, up through Tottenham Marshes, back across Pymme's Brook over a second cable bridge and then round to the northern compound. They will be either run in concrete cable troughs or be directly buried in the ground.'*
- 1.12. The details of the Proposed Scheme, as they are currently understood, are shown on Figure A-2 in Appendix A.

Scope of the Assessment

- 1.13. This report presents ecological information obtained during the following:
- A desk-study undertaken during 01/05/2023; and
 - A walkover survey of accessible land within and adjacent to the Site on 03/05/2023.
- 1.14. The walkover survey and identification of potential ecological constraints was based on the condition of the Site and its immediate surrounds encountered at the time of the walkover survey, and the information about the Proposed Scheme available at the time of producing this report. If information on the Proposed Scheme should change, the Site may need to be re-visited to establish if there are any further ecological constraints arising from changes to the proposals.

2. Methods

Desk Study

- 2.1. The geographical area for obtaining ecological data through desk studies has been determined using best practice guidance (as set out in internal Atkins guidance) and professional judgement. Baseline data has been gathered from a range of sources through data requests and using online resources as outlined below. This included data gathering in relation to statutory and non-statutory designated sites for nature conservation and protected and priority habitats and species (as defined by Chartered Institute of Ecology and Environmental Management (CIEEM) PEA guidance⁴), and an assessment of the likely importance of habitat features present for such species was also undertaken during the walkover survey.
- 2.2. The study areas used for the data gathering are detailed in Table 2-1. The desk study was undertaken on 01/05/2023. For species records collected, only those within 10 years of the data collection date have been considered within the assessment.
- 2.3. The following online resources were accessed:
- Multi-Agency Geographic Information for the Countryside (MAGIC) website⁵; and
 - Woodland Trust Ancient Tree Inventory⁶.
- 2.4. Ordnance Survey maps and Grid Reference Finder⁷ were used to identify the presence of waterbodies within 500 m of the Site boundary, in order to establish if the land within and immediately surrounding the Site could be used as terrestrial habitat for great crested newts. This species typically uses suitable terrestrial habitat up to 500 m from a breeding pond⁸. However, there is a notable decrease in great crested newt abundance beyond a distance of 250 m from a breeding pond⁹.
- 2.5. Greenspace Information for Greater London (GiGL) was contacted to request records¹⁰ of protected and priority species and habitats and details of non-statutory designated sites for nature conservation.

Table 2-1 - Data search areas

Data type	Search area – distance from Proposed Scheme boundary
Statutory designated sites for nature conservation	1 km
Non-statutory designated sites for nature conservation	500 m
Irreplaceable habitats	500 m
Veteran trees	50 m
Priority habitats and species	500 m (extended to 2 km for bats)

- 2.6. A review of local planning policy relevant to the Proposed Scheme was undertaken as part of the data gathering. The following policy documents were subject to review:
- Haringey Local Plan.

⁴ As set out in Box 1 on page 4 of the CIEEM (2019) Guidelines for Preliminary Ecological Appraisal, priority species include those listed as a national and/or local priority for conservation (i.e. a Habitat of Principle Importance or Species of Principle Importance in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006; International Union for the Conservation of Nature (IUCN) Red List or Amber List, Nationally Rare or Nationally Scarce, or endemic to a country or geographic location.

⁵ Multi-Agency Geographic Information for the Countryside (MAGIC) [Online]. Available at: <https://magic.defra.gov.uk/> [Accessed 01/05/2023].

⁶ Woodland Trust Ancient Tree Inventory [Online]. Available at: <https://ati.woodlandtrust.org.uk/> [Accessed: 01/05/2023].

⁷ UK Grid Reference Finder (2011) [Online]. Available at: <https://gridreferencefinder.com/> [Accessed: 01/05/2023].

⁸ English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.

⁹ English Nature (2004). *An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt (ENRR576)* [Online]. Available at: <http://publications.naturalengland.org.uk/publication/134002> [Accessed: 01/05/2023].

¹⁰ Within the last 10 years.

Field Survey

- 2.7. The geographical area for undertaking ecological field surveys has been determined using the current survey guidance (as detailed in Section 2.17), professional judgement and the zones of influence, which have been determined based on likely effects arising from the Proposed Scheme.
- 2.8. Following CIEEM's PEA Guidelines a walkover survey was undertaken, focusing on protected and priority habitats and/or species.
- 2.9. The walkover survey was undertaken on 03/05/2023. This included all land within the site plus a buffer of up to 50 m from the Site boundary where access was allowed (the Survey Area).

Habitats

- 2.10. Habitats were mapped using the UK Habitat Classification (UKHab) system. UKHab is a comprehensive and hierarchical habitat classification system for the UK that has been developed to benefit from recent changes in habitat categorisation, recording and analysis, and is suitable for digitally recording in the field using GIS. It is fully compatible with other major existing classifications, including Priority Habitat types (UKHab Level 4) and Habitats Directive Annex I habitat types¹¹ (UKHab Level 5).
- 2.11. All habitats were recorded to Level 3 of the UKHab hierarchy, i.e. broad habitats such as neutral grassland or dense scrub. All habitat features have been digitally mapped, using QGIS, as either polygons, lines or points and assigned to a UKHab Primary Habitat Code.
- 2.12. An assessment of the possible presence of priority habitats (as defined by CIEEM PEA guidance) was also undertaken during the walkover survey.
- 2.13. Vascular plant names recorded during this survey follow Stace¹².
- 2.14. Target notes (TNs) were used to record specific details on the plant species composition of the habitats, current management and quality. TNs were also used to record features of ecological importance (e.g. ponds, complex habitat mosaics).

Protected and priority species

- 2.15. An assessment of the possible presence of protected or priority species (as defined by CIEEM PEA guidance), and an assessment of the likely importance of habitat features present that could support such species was also undertaken during the walkover survey.
- 2.16. Surveyors used current guidance and methodologies, as referenced by CIEEM, for preliminary assessment of species.
- 2.17. The survey comprised assessing the suitability of the habitats present for, and recording any activity of the following species (in line with current guidance):
 - Badgers¹³;
 - Bats¹⁴;
 - Hazel dormice¹⁵;
 - Otters^{16,17};
 - Water voles¹⁸;
 - Breeding, wintering and passage birds¹⁹;

¹¹ Council Directive 92/43/EEC (1992) on the conservation of natural habitats and of wild fauna and flora (known as the 'Habitats Directive').

¹² Stace (2019) *New Flora of the British Isles* 4th edition.

¹³ Harris S., Cresswell P. and Jefferies D. (1989) *Surveying badgers*. Mammal Society – No9.

¹⁴ Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition)*. The Bat Conservation Trust, London.

¹⁵ English Nature (2006). *The Dormouse Conservation Handbook (2nd edition)*.

¹⁶ Chanin and Smith (2003). *Monitoring the otter Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No 10. Peterborough, English Nature.

¹⁷ Liles G. (2003). *Otter Breeding Sites. Conservation and Management*. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5. English Nature, Peterborough.

¹⁸ Dean, M. et al (2016) *The Water Vole Mitigation Handbook*. Mammal Society.

¹⁹ Bird Survey & Assessment Steering Group. (2022). *Bird Survey Guidelines for assessing ecological impacts, v.0.1.7*. Available at: <https://birdsurveyguidelines.org> [Accessed: 01/05/2023].

- Reptiles²⁰;
- Amphibians (terrestrial and aquatic habitats), including an assessment of aquatic habitat for its suitability to support great crested newts (GCN);
- Priority invertebrates²¹ and,
- Priority plants and fungi²².

2.18. Evidence of the presence of the following invasive species was recorded where seen:

- Evidence of animal species as listed on the Invasive Alien Species (Enforcement and Permitting) Order 2019; muntjac deer and grey squirrels; and
- Evidence of the presence of the following invasive plant species: Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, Himalayan balsam, rhododendron²³, New Zealand pigmy weed, Virginia creeper, variegated yellow archangel, cotoneaster²⁴, yellow azalea, few-flowered leek, montbretia, giant rhubarb, Japanese rose and three-cornered garlic. These are listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and subject to strict legal control.

Surveyor Competencies

2.19. All the surveys were led by surveyors who have been assessed to be at least of capable experience following the Chartered Institute of Ecology and Environmental Management (CIEEM) competency framework²⁵.

Limitations

2.20. This section identifies any limitations to the surveys or assessment and provides an explanation as to the effect of these on the appraisal.

2.21. The search for waterbodies within 500 m of the Site was undertaken by using Ordnance Survey plans and aerial photographs only. These sources may not show all waterbodies within 500 m of the Site boundary and, therefore, some waterbodies may not have been identified.

2.22. The list of invasive plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is extensive and these plants are found in a range of different habitats, including aquatic habitats. The field survey checked for the presence of Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, Himalayan balsam, rhododendron, New Zealand pigmy weed, Virginia creeper, variegated yellow archangel, cotoneaster, yellow azalea, few-flowered leek, montbretia, giant rhubarb, Japanese rose, three-cornered garlic. Other invasive species listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) may not have been recorded

2.23. Cryptic taxa such as some species of plant, invertebrates and fungi, could not be adequately surveyed at the time of the survey. These groups require specialist survey, and survey windows are generally highly restrictive. However, when taking into account the desk study results, the nature of the habitats present at the Site and in the surrounding landscape, this is not considered to be a significant limitation.

²⁰Froglife (1999) *Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife advice sheet 10.

²¹ At the present time there is no current survey guidance for priority invertebrates.

²² At the present time there is no current survey guidance for priority plants and fungi.

²³ Although there are approximately 1200 species of rhododendron, just one species and one of its hybrids are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended): *Rhododendron ponticum* and *Rhododendron ponticum* x *Rhododendron maximum*.

²⁴ There are approximately 100 species of cotoneaster found in the UK, but only five are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended): *Cotoneaster horizontalis*, *Cotoneaster integrifolius*, *Cotoneaster simonsii*, *Cotoneaster bullatus* and *Cotoneaster microphyllus*.

²⁵ CIEEM's Competency Framework. Available at: <https://www.cieem.net/competency-framework> [Accessed 01/05/2023].

- 2.24. The desk study reviewed the Woodland Trusts Veteran Trees inventory. This provides records of veteran trees, but is not an exhaustive list, and other veteran trees may be present in the area. The walkover survey aimed to identify such features and as such this is not considered a constraint.
- 2.25. The area of woodland to the east of the Site could not be accessed at the time of survey. This limited the survey for badger setts and invasive non-native plant species. Further surveys will be required of this area.

3. Results

Statutory and Non-statutory Designated Sites

- 3.1. Table 3-1 details the statutory and non-statutory designated sites for nature conservation identified through the desk study. The Site includes part of Tottenham Marshes Site of Importance for Nature Conservation (SINC) as shown on Figure A-3 in Appendix A.

Table 3-1 - Statutory and non-statutory designated sites for nature conservation within 1 km and 500 m²⁶ respectively of the Site

Site name	Designation	Location of designated site ²⁷	Features of interest ²⁸
Lea Valley	SPA	340 m south of the Site 230 m south of the proposed extension area	Semi-natural wetland and valley bottom habitats. Wintering birds - bittern, shoveler and gadwall.
Lea Valley	Wetland of International Importance (Ramsar Site)	340 m south of the Site 230 m south of the proposed extension area	Supports vulnerable, endangered, or critically endangered species or threatened ecological communities: whorled water-milfoil and water boatman. Wintering birds – shoveler and gadwall.
Walthamstow Reservoirs	SSSI	510 m south of the Site, 320 m south of the proposed extension boundary	Breeding and wintering waterfowl.
Lea Valley	SINC (Metropolitan Importance)	310 m east of the Site 240 m east of the proposed extension area	Aquatic flora. Wintering gadwall and shoveler. Breeding birds include kingfisher, little ringed plover, skylark and yellow wagtail.
Tottenham Marshes	SINC (Borough Grade I Importance)	Adjacent to the east of the Site Within the proposed extension boundary	Rough grassland.
Banbury Reservoir	SINC (Borough Grade I Importance)	350m east of the Site. 280 m east of the proposed extension area	Scrub and neutral grassland. Waterfowl including various gulls, grey heron, tufted duck and great crested grebe.

²⁶ This is the zone of influence for designated sites.

²⁷ Where designated sites are situated outside of the Site boundary, the distance and direction is given to the closest point that the designated site is from the Site.

²⁸ Including qualifying features of internationally designated sites and reasons for designation for SSSIs.

Site name	Designation	Location of designated site ²⁷	Features of interest ²⁸
Tottenham Marshes East	SINC (Borough Grade I Importance)	270 m south-east of the Site 220 m south of the proposed extension area	Neutral grassland.
Tottenham Hale to Northumberland Park Railsides	SINC (Borough Grade 2 Importance)	190 m south-west of the Site 330 m southwest of the proposed extension area	Rough grassland, scrub and mature woodland.
Marsh Lane Allotments	SINC (Local Importance)	190 m south of both the Site and proposed extension area	Allotments and scattered trees.

3.2. The Site is within the SSSI Impact Risk Zone of the Walthamstow Reservoirs SSSI and Lee Valley SPA and Ramsar Site and the proposed extension area is within the Tottenham Marshes SINC. These may pose a constraint to the Proposed Scheme and recommendations are provided in Section 4.

3.3. The remaining statutory and non-statutory designated sites will not be affected by the works due to the distance of the sites from the Site and the lack of hydrological connections, and as a result are not discussed further within this report as they are not considered to pose a constraint to the Proposed Scheme.

Irreplaceable/Priority habitats

3.4. No irreplaceable habitats were identified during the desk study,

3.5. The search on MAGIC⁵ identified eight parcels of deciduous woodland within 500 m of the Site. The closest parcel of deciduous woodland being within the proposed extension area within the Site.

3.6. No other priority habitats were identified within 500 m of the Site during the desk study.

3.7. No veteran trees were identified within 50 m of the Site.

Habitats and Priority Plants and Fungi

3.8. Table 3-4 lists all of the UKHab Level 3 habitats present within the survey area. The table also provides details of the area²⁹ of each habitat within the Survey Area and the proportion of the Site this makes up. Habitats are mapped on the Habitat Survey Plan (Figure B-1 in Appendix B).

3.9. The operational area of the Site is made up of built-up areas, with buildings and hardstanding (u1, TN01). There are areas of neutral grassland (g3, TN06) within the Site with the largest area being along the eastern boundary and small patches in the north-east corner and south of the Site. The areas of modified grassland (g4, TN02) are scattered within the centre of the Site. Within the Site areas of dense scrub (h3, TN03) were identified. To the east of the operational Site in the proposed extension boundary there is a parcel of woodland (w1, TN05) spanning from the north to the south of the proposed extension area with the Pymme's Brook (r2) running adjacent to the west of the woodland within the proposed extension area.

3.10. A full list of plant species recorded is provided in Appendix C.

²⁹ The area of each habitat was measured using ArcGIS.

Table 3-2 - Habitat types within the Survey Area

UKHab level 3 habitat type	Location of habitat	Area of habitat/distance of linear feature	
		Ha/m	% of Site
Neutral grassland (g3, TN06)	Within the Site along the eastern boundary	1.04	15.50
Modified grassland (g4, TN02)	Scattered within the Site	0.009	0.14
Broadleaved mixed and yew woodland – (w1, TN05)	Within the proposed extension area to the east of the Site between the river and neutral grassland	1.21	18.03
Dense scrub (h3, TN03)	Scattered within the neutral grassland within the Site along the eastern boundary	0.29	4.32
Built-up areas and gardens (u1, TN01)	Within the operational part of the Site to the west	4.16	62.01
Rivers and streams (r2)	Running through the proposed extension area to the east of the Site	380.37 (m)	N/A

Priority Plants and Fungi

- 3.11. GiGL provided no recent records of priority plants or fungi within 500 m of the Site.
- 3.12. The field survey on the 03/05/2023 identified no priority plants or fungi.
- 3.13. There is potentially suitable grassland and woodland habitat for priority plants and fungi. These may pose a constraint to the Proposed Scheme and recommendations are provided in Section 4.

Protected and Priority Animal Species

- 3.14. Evidence of protected and priority species, or habitats with the potential to support protected and priority species are indicated on the Habitat Survey Plan (Figure B-1 in Appendix B), with specific features highlighted by TNs on the map. TN descriptions are provided in Table B.1 in Appendix B. Details of legislation relating to protected species is provided in Appendix D.
- 3.15. Protected and priority species are not discussed further within this report where the following applies:
- A species distribution range does not cover the Site location; and
 - No evidence of the species was recorded within the survey area and/or no potentially suitable habitat for the species has been recorded within the zone of influence of the species.

Badgers

- 3.16. GiGL provided no recent records of badger within 500 m of the Site.
- 3.17. The field survey on the 03/05/2023 assessed the survey area for evidence of badgers (setts, latrines, feeding signs and mammal track) and potential habitats to support badgers. The field survey identified no evidence of badgers. However, the area of woodland to the east of the Site within the proposed extension area could not be surveyed, therefore there is potential for badgers to be using the woodland.
- 3.18. As potentially suitable commuting, foraging and sett building habitat for badger has been recorded within the survey area this species may pose a constraint to the Proposed Scheme and recommendations are provided in Section 4.

Bats

- 3.19. GiGL provided eight recent records of bats including Daubenton's bat, Leisler's bat, noctule, Nathusius's pipistrelle, common pipistrelle, soprano pipistrelle, unidentified pipistrelle species and an unidentified bat species. The closest record was 362 m south for Daubenton's bat, Leisler's bat, Nathusius's pipistrelle, common pipistrelle and soprano pipistrelle. No recent records for bat roosts were provided within 2 km of the Site. MAGIC returned one European Protected Species (EPS) licence for the destruction of a resting place of brown long-eared bat from 07/05/2015 to 31/05/2020 approximately 1.6 km south of the Site.
- 3.20. The field survey on the 03/05/2023 identified the woodland as being suitable for roosting bats, the grassland and Pymme's Brook offer potential for foraging and commuting bats. The building on Site (TN01) has negligible potential for roosting bats as the building was in a good, sealed condition with no obvious potential roosting features (PRF) for bats.
- 3.21. As potentially suitable commuting, foraging and roosting habitat for bats has been recorded within the survey area this species may pose a constraint to the Proposed Scheme and recommendations are provided in Section 4.

Hazel Dormice

- 3.22. GiGL provided no recent records of hazel dormouse within 500 m of the Site. MAGIC returned no EPS licences for hazel dormouse within 500 m of the Site.
- 3.23. The field survey on the 03/05/2023 identified no suitable habitat for hazel dormouse. The woodland within the non-operational area of the Site is linked to habitat outside of the Site, but in the wider context, its isolated within an urban area with rivers either side of the woodland. Also, no dormice have been recorded in the local area and therefore are unlikely to be present.
- 3.24. As no suitable habitat for hazel dormice has been recorded within the survey area, this species is not discussed further within this report as it is not considered to pose a constraint to the Proposed Scheme.

Otters

- 3.25. GiGL provided no recent records for otter within 500 m of the Site. MAGIC returned no EPS licences for otter within 500 m of the Site.
- 3.26. The field survey on the 03/05/2023 identified the Pymme's Brook within the proposed extension area as not providing suitable habitat for resting, holt creation or foraging due to the concrete banks and lack of vegetation. The River Lee 144 m east of the Site is unsuitable for otter holt creation, resting and foraging due to the concrete banks and lack of vegetation. Both the Pymme's Brook and River Lee could be used by commuting otter, however due to the large distance to suitable habitats for resting, holt creation and foraging it is unlikely that otters would be found near the Site.
- 3.27. As no suitable habitat for otters has been recorded within the survey area, this species is not discussed further within this report as it is not considered to pose a constraint to the Proposed Scheme.

Water Voles

- 3.28. GiGL provided no recent records for water vole records within 500 m of the Site.
- 3.29. The field survey on the 03/05/2023 identified the Pymme's Brook within the proposed extension area as not providing suitable habitat for water vole due to the concrete banks. The River Lee 144 m east of the Site is also unsuitable for water vole due to the concrete banks.
- 3.30. As no suitable habitat for water voles has been recorded within the survey area, this species is not discussed further within this report as it is not considered to pose a constraint to the Proposed Scheme.

Breeding and Wintering Birds

- 3.31. GiGL provided 34 recent records for breeding birds and wintering birds within 500 m of the Site, including 11 Schedule 1³⁰ bird species breeding birds: brambling, red kite, firecrest, redwing and fieldfare. Wintering birds: scaup, whooper swan, whimbrel, black-necked grebe, greenshank and green sandpiper) 145 m south-east of the Site. Walthamstow Reservoirs SSSI is located 230 m south of the Site and provides suitable habitat for wintering birds therefore, an assent for Proposed Scheme works may need to be obtained from Natural England.
- 3.32. GiGL provided 24 recent records of Birds of Conservation Concern 5 (BoCC5)³¹ red list species (breeding birds: skylark, tree pipit, swift, greenfinch, cuckoo, house martin, lesser spotted woodpecker, yellowhammer, linnet, nightingale, yellow wagtail, spotted flycatcher, house sparrow, whinchat, woodcock, starling, ring ouzel, mistle thrush and lapwing. Wintering birds: pochard, goldeneye, ringed plover, herring gull, curlew) 145 m south-east of the Site.
- 3.33. The field survey on the 03/05/2023 identified suitable breeding and foraging habitat for breeding birds. The grassland is potentially suitable for wintering birds; however, the surrounding reservoirs provide more suitable habitat. The buildings within the operational area of the Site and the scrub and grassland within the non-operational areas of the Site. as well as the woodland within the proposed extension area, offer potential habitat for breeding birds.

Reptiles

- 3.34. GiGL provided one recent record for reptiles within 500 m of the Site. The species recorded was a grass snake 64 m south-east of the Site.
- 3.35. The field survey on the 03/05/2023 identified the following suitable habitats for widespread species of reptile
- 3.36. Commuting, foraging, refuge and hibernating habitat: woodland, neutral grassland and bramble scrub located within the eastern proposed extension boundary.
- 3.37. Basking habitat: hardstanding within the Site.
- 3.38. As suitable habitat for widespread species of reptile has been recorded within the survey area these species may pose a constraint to the Proposed Scheme and recommendations are provided in Section 4.

Amphibians

- 3.39. GiGL provided no recent records of amphibians including GCN within 500 m of the Site. The MAGIC5 search did not identify any waterbodies which could be used by this species within 500 m of the Site. MAGIC returned no EPS licences for GCN.
- 3.40. The field survey on the 03/05/2023 identified no suitable breeding habitats for GCN within the Site and within 500 m of the Site. The woodland within the eastern Proposed Scheme boundary is potential habitat for GCN, however with no ponds within 500 m it is highly unlikely GCN will be found on Site. Therefore, this species is not discussed further within this report as it is not considered to pose a constraint to the Proposed Scheme.

Priority Invertebrates

- 3.41. GiGL provided no recent records for priority invertebrate records within 500 m of the Site.
- 3.42. The field survey on the 03/05/2023 identified potentially suitable habitat for priority invertebrates such as woodland, grassland, scrub.
- 3.43. These species may pose a constraint to the Proposed Scheme and recommendations are provided in Section 4.

Invasive Non-native Species

- 3.44. GiGL provided no recent records for invasive non-native species within 500 m of the Site.
- 3.45. The field survey on the 03/05/2023 identified no invasive non-native species. However, the woodland within the proposed extension area within the Site to the east was not surveyed but has potential to contain invasive non-native plant species (INNPS). Therefore, INNPS's may pose a constraint to the Proposed Scheme and recommendations are provided in Section 4.

4. Constraints and Recommendations

Key Constraints

- 4.1. The desk study and walkover survey has identified protected and priority species that occur or could potentially occur on Site including:
 - Bats (roosting, foraging and commuting);
 - Badger;
 - Breeding birds;
 - Widespread species of reptiles; and
 - Priority invertebrates.
- 4.2. The construction works associated with the Proposed Scheme may cause disturbance and damage and/or loss of habitats within the Tottenham Marshes SINC.
- 4.3. The works are also in close proximity to The Lea Valley SPA and Ramsar site and Walthamstow SSSI. The construction works associated with the Proposed Scheme may cause disturbance and/or damage to the qualifying features of these designated sites.
- 4.4. The Proposed Scheme could potentially affect these protected and priority species identified within the zone of influence, e.g. temporary or permanent removal of vegetation could adversely affect and impact upon habitats potentially used by bats, breeding birds, widespread species of reptile and priority invertebrates.
- 4.5. INNPS could be present on Site and may pose a constraint to construction due to the risk of spreading these plants within or outside of the Site.

Design Stage Recommendations

Consenting process and DCO commitments

- 4.6. It is understood that these works will be delivered under an existing DCO for the NLRP. If this is the case, the DCO must be reviewed for any environmental commitments which must be considered during the design process and prior to construction works. For example, the NLRP *Table of Environmental Measures*³² includes a number of biodiversity commitments which specifically mention works close to Tottenham substation including:
 - Restoration of semi-improved grassland within Tottenham Marshes [along the cable corridor] (transferred to the DCO order as Req. 12 Ecological Management Strategy).
- 4.7. These measures are taken from those described in Table 9.6 of the Environmental Statement³³, as being incorporated into the NLRP scheme.
- 4.8. DCO Reg. 12 (1) (Ecological Management Strategy) states that: *"No stage of the authorised development shall commence until a written ecological management strategy applicable to that stage, reflecting the ecological measures included in the environmental measures document, has after consultation with the Environment Agency, Natural England and, where it refers to any land within the boundary of the Lee Valley Regional Park, Lee Valley Regional Park Authority, been submitted to and approved by the relevant planning authority"*.
- 4.9. If the Proposed Scheme forms part of the DCO, the status of the Ecological Management Strategy document and status mitigation measures committed to by the DCO should be determined prior to the commencement of construction works on site to ensure that the proposed works comply with the DCO. Any measures required during construction should be incorporated into the design and planning of construction.
- 4.10. If another consenting route is required, such as a planning application, it is recommended this is accompanied by an ecological impact assessment which would assess the impacts of the Proposed Scheme on important ecological features and detail information about the ecological design and mitigation strategy for the Proposed Scheme.

³² National Grid, July 2014, *Table of Environmental Measures*

³³ National Grid, August 2012. Document 6.2 Environmental Statement – Volume 2. National Grid (North London Reinforcement Project) Order. Chapter 9, Biodiversity.

Lee Valley SPA and Ramsar

- 4.11. The Proposed Scheme lies 230 m north of the Lea Valley Ramsar site, Lee Valley SPA and Walthamstow Reservoirs component SSSI. There may be potential for construction works to disturb wintering and migratory species associated with these designated sites, or for habitats within the designated sites to be affected by pollution incidents.
- 4.12. The Environmental Statement for the NLRP³⁴ concluded that there would be no significant effect on the Lea Valley Ramsar and SPA. However, it is recommended that this conclusion is re-assessed to take into account any updated working areas, construction techniques (particularly in relation to anticipated noise) and updated information regarding birds using the designated sites. It is recommended that this is documented in Habitat Regulations Assessment (HRA) screening report.
- 4.13. The Proposed Scheme is also within 230 m of Walthamstow SSSI. Therefore, an assent for Proposed Scheme works may need to be obtained from Natural England.

Tottenham Marshes SINC

- 4.14. The Proposed Scheme is taking place within Tottenham Marshes SINC. The boundaries of the SINC are provided on Figure A-3 in Appendix A. This includes some temporary loss of habitat beneath the pylon and along the cabling corridor (approximately 12 m in width). The NLRP Environmental Statement³³ and Table of Environmental Measures³² includes a number of measures in relation to Tottenham Marshes to be included in an Ecological Management Strategy for the NLRP. Measures set out in the Environmental Statement (Table 9.6) include:
- “Within Tottenham Marshes the working area will be subject to extensive excavation. The area of semi-improved grassland that will be disturbed will be removed from the site as turfs. These turfs will be stored and maintained during the construction period and then replaced once the cabling has been completed. This is preferred to re-seeding as, ecologically and visually, the translocated grassland will be more similar to the adjoining, retained grassland”.
 - *Bat boxes will be erected on trees to compensate for the loss of trees in the Lee Valley Country Park [Lee Valley Regional Park], in woodland close to ZBC 19 and on Tottenham Marshes, where trees with the potential to be used by roosting bats will be felled”.*
- 4.15. These measures should be reviewed and taken into account as the design and construction programme develops. It is recommended losses of habitat within the SINC should be minimised as much as possible, through careful design of the permanent and temporary works (e.g. locating proposed compounds on existing hardstanding or arable land outside of the SINC).

Protection of Habitats and Species

- 4.16. To reduce the impact of the Proposed Scheme on habitat and species, losses of grassland, scrub, woodland and trees should be minimised as much as possible, through careful design of the permanent and temporary works (e.g. locating proposed compounds on existing hardstanding or arable land).

³⁴ National Grid, August 2012. Document 6.2 Environmental Statement – Volume 2. National Grid (North London Reinforcement Project) Order. Chapter 9, Biodiversity.

- 4.17. It is understood that the client National Grid has made a commitment to a 10% Biodiversity Net Gain (BNG). Atkins have not been commissioned to assess this Scheme for BNG. Therefore, further surveys and assessments will be necessary if a calculation of BNG is required

Further Survey Requirements

- 4.18. It is understood that WSP ecological consultancy is conducting surveys for the client in relation to another but related scheme, however details are at present unknown. Consultation with WSP is recommended to avoid duplication of ecological survey effort and to share results and data.
- 4.19. Once timescales, plans and methods are finalised and the scale and extent of vegetation clearance is confirmed for the Proposed Scheme, further ecological surveys may be required (particularly if extensive clearance of habitat is proposed) to determine the impacts of the Scheme and inform mitigation requirements.
- 4.20. Potential survey requirements are listed below. These recommendations will require review as the design develops. Ecological surveys are seasonally constrained. The timing of surveys should be taken into account within the project programme.

Bats

Preliminary Roost Assessment

- 4.21. Should the Proposed Scheme require removal of trees, a preliminary roost assessment of all affected trees should be undertaken to check for PRFs such as woodpecker holes, rot holes, cracked limbs, dense ivy and flaking bark.
- 4.22. Preliminary roost assessments can be undertaken at any time of year but are best carried out in winter after leaves have fallen as it may not be possible to see all PRFs when trees are in full leaf. The assessment should involve a detailed ground level visual examination of trees, from ground level, during daylight hours and aided with the use of binoculars and a bright torch.
- 4.23. Where PRFs are noted, these should be subject to a climbed/endoscope inspection (where safe to do so) to search for evidence of bats or further indication of the potential suitability of each PRF to support bats.

Presence/ Likely Absence Surveys

- 4.24. Any trees identified as having potential suitability to support roosting bats may require surveys to determine the presence/ likely absence of a bat roost. These surveys can be climbed inspections (where safe to do so) or dusk emergence surveys. The number of surveys required and timing of surveys is dependent on the suitability of the features within the trees, and should be undertaken between May and September.
- 4.25. If bat roosts are confirmed as present and trees cannot be avoided, a licence from Natural England may be required prior to tree removal.

Badgers

- 4.26. An update inspection survey should be carried out in advance of construction of all land within the Proposed Scheme boundary and a 50 m buffer extending out in all directions (where access allows, access to the woodland area needs to be granted for the survey) for evidence of badger activity including setts, latrines, dung pits, prints, snuffle holes (created when foraging), pathways, hairs (e.g. caught on fencing) and scratching posts.
- 4.27. If badger setts are found, and damage or disturbance cannot be avoided, a licence from Natural England may be required for construction.

Breeding Birds

- 4.28. Dependent upon confirmation of the scale, extent and types of habitat affected, breeding bird surveys may be required to assess the impacts of the scheme. Surveys should be undertaken following the principles of the Common Birds Census (CBC) mapping methodology developed by the British Trust for Ornithology (BTO), conducted between March and August inclusive.
- 4.29. Should the extent of vegetation clearance be of a sufficiently small and/or restricted scale, advance breeding bird surveys may not be required.

Widespread Reptile Species

- 4.30. Dependent upon confirmation of the scale, extent and types of habitat affected (i.e. if a sufficiently large area of habitat suitable for reptiles will be lost), presence/ likely absence surveys for reptiles may be required to be carried out between April and September to determine what species of reptiles are present at the site. It is understood that WSP ecological consultancy is conducting surveys for the client in relation to another related scheme however details are at present unknown. Consultation with WSP is recommended to avoid duplication of effort and to share results and data.
- 4.31. Further survey visits may be required if reptiles are identified as present, to obtain an estimate of the population sizes within the site, in accordance with standard survey guidance.
- 4.32. However, should the extent of vegetation clearance be of a sufficiently small and/or restricted scale, reptile survey may not be required and works may be undertaken following measures detailed in a Precautionary Method of Working (PMW).

Surveys to inform Biodiversity Metric Calculations

- 4.33. It is understood that the client National Grid has made a commitment to a 10% BNG. Should BNG assessments be required, further botanical/habitat surveys should be undertaken to categorise habitats according to the BNG methodology..

Mitigation

- 4.34. This report is based on a preliminary assessment, and further details on the impacts of the Proposed Scheme on ecological features may be gathered at a later stage (for example, after further surveys have been carried out, should any be required). Therefore, the mitigation proposed in this section has not yet been informed by a detailed assessment, and additional mitigation measures may be identified at a later stage.
- 4.35. These measures may include protected species licences from Natural England required in advance of construction works depending upon the results of further survey and confirmation of the scale of habitat loss.

General measures

- 4.36. Pollution prevention: the proposed works should be undertaken in accordance with best practice in relation to pollution prevention. It is recommended that all works adhere to the Pollution Prevention Guidelines (PPGs) and the Construction Industry Research and Information Association (CIRIA) environmental good practice and control of water pollution. These detail good practice advice for undertaking works which may have the potential to cause pollution including management of fine sediment run-off from construction areas.
- 4.37. All materials should be stored in accordance with the relevant regulations where possible on existing hardstanding, with spillage containment measures to minimise the risk of pollution from stored plant and materials.
- 4.38. Measures to avoid harm to habitats and species should be included in a Construction Environmental Management Plan (CEMP), along with reference to any specific method statements, Precautionary Methods of Working or mitigation licences required for species (see recommendations below). This should also include record keeping of measures taking on site regarding species or installation of any mitigation or design measures such as installation of bird boxes.

Protection of designated sites and habitats

- 4.39. It is recommended that the potential for effects on the Lea Valley Ramsar and SPA is re-assessed to take into account any updated working areas, construction techniques (particularly in relation to anticipated noise) and if potential impacts are identified (i.e. disturbance) measures may be required to avoid or reduce these impacts.
- 4.40. The Proposed Scheme (and any advance ground investigation (GI) works if required) should be undertaken in a manner that minimises damage to habitats within the Tottenham Marshes SINC. The NLRP Environmental Statement³³ and Table of Environmental Measures³² includes a number of measures to mitigate and compensate for the loss of habitats within the SINC, to be included in an Ecological Management Strategy for the NLRP. The following measures are recommended:
- It is recommended that any information about any particularly sensitive parts of the SINC should be obtained from the current leaseholders or site managers to ensure that these can be avoided during the advance GI works;
 - Access routes through the SINC during construction (and any advance GI works if required) should utilise existing tracks or paths;
 - Any site compound or storage areas should make use of existing hardstanding or gravel areas of the Site, or arable habitat;
 - Working areas should be minimised as much as possible, and retained habitat should be protected from accidental incursion;
 - All habitats disturbed or temporarily affected during the Proposed Scheme (and any advance GI works if required) should be reinstated. This includes careful storage and reinstatement of topsoil in grassland areas; and
 - If excessive damage to habitats is considered likely during construction (or any advance GI works if required) e.g. due to wet ground conditions and heavy vehicles or machinery, measures to avoid damage should be implemented such as the use of ground protection/track matting.
- 4.41. The Proposed Scheme is also within 230 m of Walthamstow SSSI. Therefore, an assent for Proposed Scheme works may need to be obtained from Natural England.
- 4.42. Measures to protect retained trees within and immediately adjacent to the Site should be implemented during construction. Location of access tracks, haul roads, site compounds and material storage areas will be sited away from retained trees.

Bats

- 4.43. During the bat active season (April to October) night-time lighting (taken to be 30 minutes before dusk to 30 minutes after dawn) should be avoided. If this is not possible, any night-time lighting required for construction should include measures to reduce light spill into adjacent habitat and protect bat foraging routes and potential roosts.
- 4.44. Measures will depend on the results of surveys. If bats or evidence of a roost is found and the roost cannot be retained and protected, it will be necessary to apply for an EPS mitigation licence.
- 4.45. If no roosts are found but any trees with high or moderate potential for roosting bats require removal to facilitate construction or for health and safety reasons, an updated climbing inspection by a bat licenced ecologist immediately prior to removal should be carried out to confirm bats are absent. If the tree cannot be felled on the same day, and bats are absent, the feature should be blocked to prevent use in the interim period prior to felling. If bats or evidence of bats are found then it will be necessary to apply for an EPS mitigation licence.
- 4.46. Full details of the bat EPS mitigation licence, including detailed mitigation and compensation measures, would be agreed with Natural England. Mitigation and compensation measures set out in the EPS licence must be adhered to during construction. Post construction monitoring may be required.

Badgers

- 4.47. Prior to construction, an updated check for badger setts should be carried out. If access to the woodland cannot be organised the works should be carried out under a PMW. This should include information about how to recognise badger signs and setts, how to carry out works to avoid harm to badgers, and what site personnel should do if they find a badger sett.

Breeding Birds

4.48. Tree felling and vegetation clearance should be minimised as far as practicable and undertaken outside the core bird nesting season (1 March to 31 August) to avoid damage or destruction of occupied nests or harm to breeding birds. If this cannot be achieved, works within the core bird nesting season will require an inspection of vegetation to be cleared for nesting birds by a suitably qualified ecologist no more than 24 hours prior to any works being undertaken. If any nesting birds are identified during the survey, they should be left in situ for their entire nesting period until the young birds have fledged. Alternative approaches to the work will need to be proposed e.g. leaving an exclusion zone around the nest to avoid disturbance.

4.49. All cleared vegetation should be rendered unsuitable for nesting birds, for example, by covering or chipping depending on the end purpose of the vegetation or should be removed from the works area.

Reptiles

4.50. If loss of habitats suitable for reptiles can be sufficiently minimised, it is recommended that these measures are captured in a written method statement, such as a PMW. This should include information about how to recognise reptiles, how to carry out works to avoid harm to reptiles, and what site personnel should do if they find a reptile. This may include: careful clearance of habitat using a two stage cut, checking for reptiles at each stage; careful dismantling and clearance of any potential sheltering locations such as log piles of other debris and careful stripping of topsoil.

If extensive clearance of vegetation is proposed and reptiles are confirmed as present during survey work, it may be necessary for a reptile translocation to be undertaken prior to construction to remove reptiles from the working area. Habitat creation or habitat management would be required to provide alternative habitat for reptiles.

Invasive non-native plant species

4.51. It is recommended that prior to construction, an updated check for invasive non-native plant species should be carried out.

Opportunities for Ecological Enhancements and Biodiversity Net Gain

4.52. It is understood that the client National Grid has made a commitment to a 10% Biodiversity Net Gain (BNG). Atkins have not been commissioned to assess this Scheme for BNG. Therefore, further surveys and assessments will be necessary if a calculation of BNG is required.

4.53. It is suggested that should any removal of any woody material or trimming of tree branches be required that arisings be used to create log piles as invertebrate habitat (e.g. due to potential presence of priority invertebrates).

5. Conclusion

- 5.1. The Proposed Scheme is within 230 m of the Lea Valley Ramsar and SPA. Construction works may affect the qualifying species and features of interest within these designated sites. Therefore, an HRA screening/scoping may be required (dependent upon DCO) to be undertaken to see if the Proposed Scheme is likely to cause significant effects on the integrity of these European sites.
- 5.2. The Proposed Scheme is also within 230 m of Walthamstow SSSI. Therefore, an assent for Proposed Scheme works may need to be obtained from Natural England.
- 5.3. The Proposed Scheme (and any advance GI works) should be designed and undertaken in a manner that minimises damage to habitats within the Tottenham Marshes SINC.
- 5.4. The Proposed Scheme could potentially affect the ecological features and protected and priority species identified within the zone of influence, e.g. removal of vegetation could adversely affect and impact upon habitats potentially used by bats, badger, breeding birds and widespread species of reptile.
- 5.5. Once timescales, plans and methods are finalised and the extent of vegetation clearance has been confirmed for the Proposed Scheme, it is recommended that further ecological advice should be obtained prior to the commencement of works. For some species: bats licences may be required for the Proposed Scheme depending on the results of surveys and Scheme design.

Report Validity

- 5.6. In the event of scope or programme changes or if works do not commence within 12 months of the date of this report then updates to the surveys may be required to ensure the validity of the data, as per CIEEM guidance³⁵.

³⁵ CIEEM (2019) Advice Note on the Lifespan of Ecological Reports and Surveys

Appendices



Appendix A. Site Location and Proposed Scheme Drawings

Figure A-1 - Site Location Plan



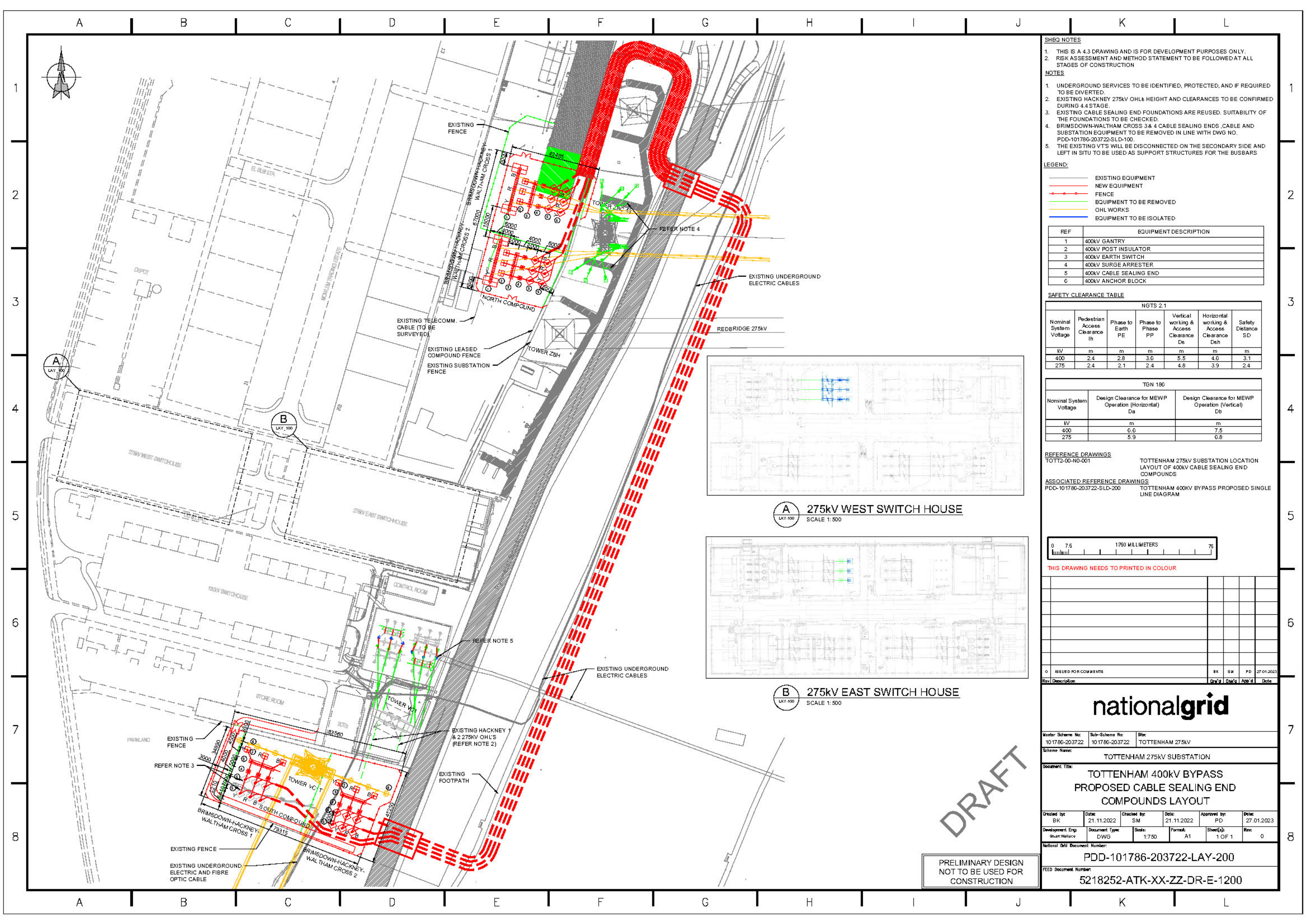
Legend

-  Site boundary
-  Operational boundary
-  Proposed extension works



Original scale: 1:1,800		Version: 1.0
Base Mapping: Imagery ©2023 Getmapping plc, Infoterra Ltd & Bluesky, Maxar Technologies, Map data ©2023		
Atkins Limited © Woodcote Grove, Ashley Road, Epsom, Surrey, KT18 5BW		
Client: National Grid		
Project: HWUP Tottenham Substation		
Job No: 5218252.302		
Title: Tottenham Substation Location Plan		
Drawn by: AK Date: 01/06/2023	Checked by: JB Date: 20/06/2023	Reviewed by: VH Date: 04/07/2023

Figure A-2 - Scheme Drawing - PDD-101786-203722-LAY-200-REV - 0 (3)



- SHEQ NOTES**
- THIS IS A 4.3 DRAWING AND IS FOR DEVELOPMENT PURPOSES ONLY.
 - RISK ASSESSMENT AND METHOD STATEMENT TO BE FOLLOWED AT ALL STAGES OF CONSTRUCTION
- NOTES**
- UNDERGROUND SERVICES TO BE IDENTIFIED, PROTECTED, AND IF REQUIRED TO BE DIVERTED.
 - EXISTING HACKNEY 275kV OHL & HEIGHT AND CLEARANCES TO BE CONFIRMED DURING 4.4 STAGE.
 - EXISTING CABLE SEALING END FOUNDATIONS ARE REUSED. SUITABILITY OF THE FOUNDATIONS TO BE CHECKED.
 - BRIMSDOWN-WALTHAM CROSS 3 & 4 CABLE SEALING ENDS, CABLE AND SUBSTATION EQUIPMENT TO BE REMOVED IN LINE WITH DWG NO. PDD-101786-203722-SLD-100.
 - THE EXISTING VT'S WILL BE DISCONNECTED ON THE SECONDARY SIDE AND LEFT IN SITU TO BE USED AS SUPPORT STRUCTURES FOR THE BUSBARS

LEGEND:

- EXISTING EQUIPMENT
- NEW EQUIPMENT
- FENCE
- EQUIPMENT TO BE REMOVED
- OHL WORKS
- EQUIPMENT TO BE ISOLATED

REF	EQUIPMENT DESCRIPTION
1	400kV GANTRY
2	400kV POST INSULATOR
3	400kV EARTH SWITCH
4	400kV SURGE ARRESTER
5	400kV CABLE SEALING END
6	400kV ANCHOR BLOCK

SAFETY CLEARANCE TABLE

NGTS 2.1						
Nominal System Voltage	Pedestrian Access Clearance Ih	Phase to Earth PE	Phase to Phase PP	Vertical working & Access Clearance Dh	Horizontal working & Access Clearance Dsh	Safety Distance SD
kV	m	m	m	m	m	m
400	2.4	2.8	3.6	5.5	4.6	3.1
275	2.4	2.1	2.4	4.8	3.9	2.4

TGN 180

Nominal System Voltage	Design Clearance for MEWP Operation (Horizontal) Dh	Design Clearance for MEWP Operation (Vertical) Dv
kV	m	m
400	6.6	7.5
275	5.9	6.8

REFERENCE DRAWINGS
TOTT2-00-NO-001 TOTTENHAM 275kV SUBSTATION LOCATION LAYOUT OF 400kV CABLE SEALING END COMPOUNDS

ASSOCIATED REFERENCE DRAWINGS
PDD-101786-203722-SLD-200 TOTTENHAM 400kV BYPASS PROPOSED SINGLE LINE DIAGRAM



THIS DRAWING NEEDS TO PRINTED IN COLOUR

Rev	Description	Rev	Description	Rev	Description	Rev	Description
0	ISSUED FOR COMMENTS						

nationalgrid

Master Scheme No: 101786-203722 Sub-Scheme No: 101786-203722 Site: TOTTENHAM 275kV

Scheme Name: TOTTENHAM 275kV SUBSTATION

Document Title: TOTTENHAM 400kV BYPASS PROPOSED CABLE SEALING END COMPOUNDS LAYOUT

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DRAFT

PRELIMINARY DESIGN
NOT TO BE USED FOR
CONSTRUCTION

Figure A-3 - Tottenham Marshes SINC

Legend

- Site boundary
- Operational boundary
- Proposed extension works
- Tottenham Marshes SINC

0 75 150 m

Original scale:
1:2400

Figure No. A-3

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Project: HWUP Tottenham Substation

Client: National Grid

Title: Tottenham Marshes SINC Location Plan

Drawn by:
EH
Date:
03/07/2023

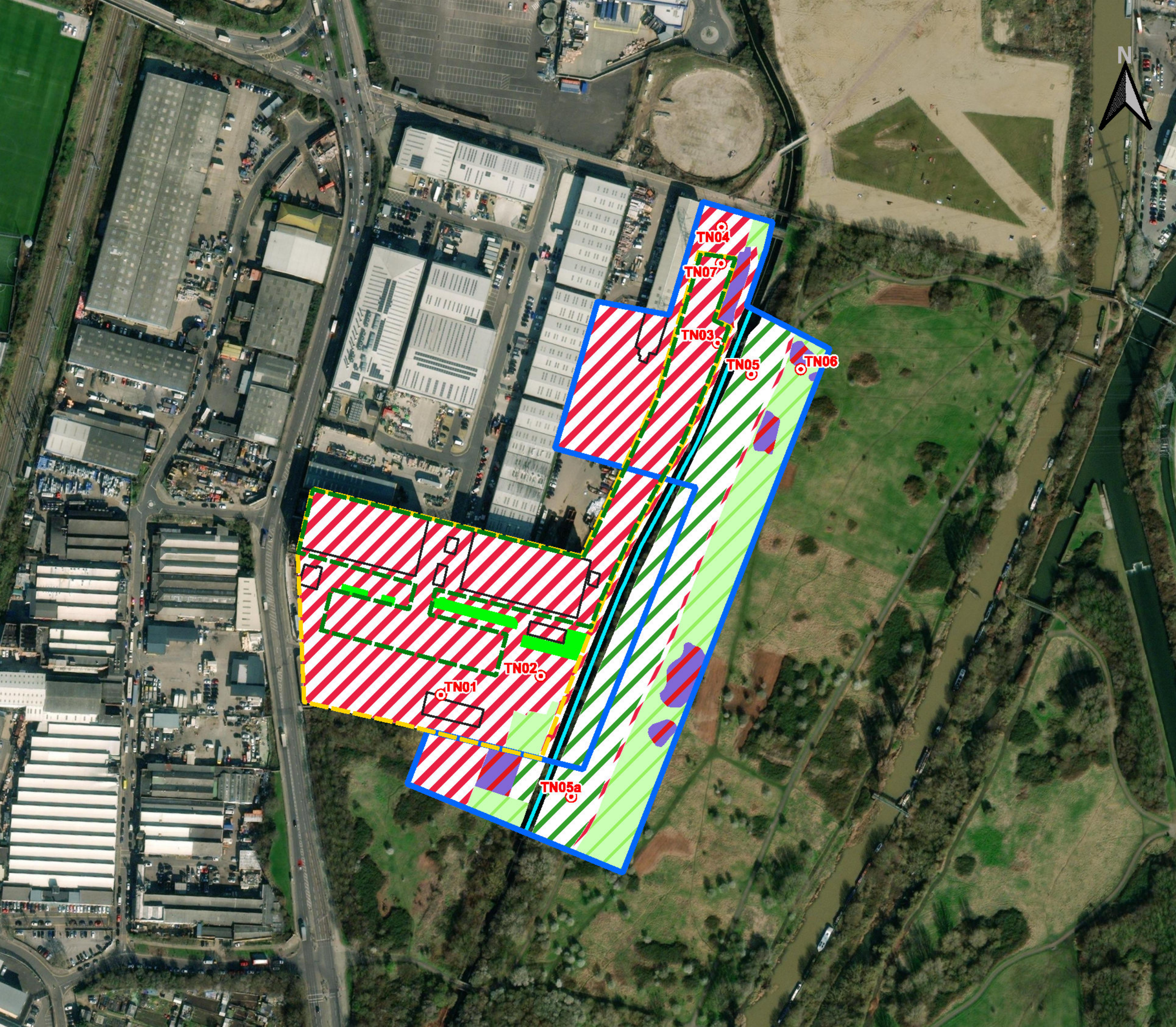
Checked by:
JB
Date:
03/07/2023

Reviewed by:
VH
Date:
04/07/2023

Tottenham Marshes

Appendix B. Habitat Survey Plan and Target Notes

Figure B-1 - Habitat Survey Plan



ATKINS

Member of the SNC-Lavalin Group

Legend

- Site boundary
- Operational boundary
- Proposed extension works
- Target notes
- Buildings
- r2 - river and streams
- g3 - neutral grassland
- g4 - modified grassland
- h3 - dense scrub
- u1 - built-up areas and gardens
- w1 - broadleaved mixed and yew woodland

0 65 130 m

Original scale: 1:2,300	Version: 1.0
Base Mapping: Imagery ©2023 Getmapping plc, Infoterra Ltd & Bluesky, Maxar Technologies, Map data ©2023	
Atkins Limited © Woodcote Grove, Ashley Road, Epsom, Surrey, KT18 5BW	
Client: National Grid	
Project: HWUP Tottenham Substation	
Job No: 5218252.302	
Title Tottenham Substation UK Habs Survey Plan	
Drawn by: AK Date: 02/06/2023	Checked by: JB Date: 20/06/2023
Reviewed by: VH Date: 04/07/2023	

Target Notes

Table B-1 - Summary of target notes

Target note	Description	Photograph
TN01	Building with brick walls, a flat roof with skylights. All in good, sealed condition, negligible bat roost potential	
TN02	Grassland around the pylon. With species including dandelion, common speedwell, daisy, cranesbill sp., upright brome, cow parsley, dock sp., and herb-Robert.	
TN03	Area of common hogweed, cleavers, buddleia, nightshade sp and comfrey	
TN04	Neutral grassland with species including common dead nettle, chickweed, cow parsley, buddleia, cranesbill sp., greater celandine, bramble, red dead nettle, rye grass, fescue sp. and ribwort plantain	

Target note	Description	Photograph
TN05	Broadleaved mixed and yew woodland with species including hawthorn, field maple, white poplar, aspen, sycamore and rose sp.	 
TN05a	White poplar with bat roosting potential	
TN06	Neutral grassland with species including timothy, red deadnettle, cleavers, barren brome, bramble, hawthorn, common hogweed, cut leaved cranesbill, field mustard, Prunus sp., meadow buttercup and meadow grass	

Target note	Description	Photograph
TN07	Area adjacent to the last pylon. Gravel with ephemeral vegetation	

Appendix C. Site plant species list

Table C-1 – Plant species list for the Site

Species name (Stace ³⁶)	Scientific name
Dandelion	<i>Taraxacum officinale</i>
Common field-speedwell	<i>Veronica persica</i>
Daisy	<i>Bellis perennis</i>
Cranesbill sp.	<i>Geranium</i>
Upright brome	<i>Bromus erectus</i>
Cow parsley	<i>Anthriscus sylvestris</i>
Dock sp.	<i>Rumex spp.</i>
Herb-Robert	<i>Geranium robertianum</i>
Common hogweed	<i>Heracleum sphondylium</i>
Cleavers	<i>Galium aparine</i>
Buddleia	<i>Buddleja davidii</i>
Nightshade sp.	<i>Solanum sp.</i>
Comfrey sp.	<i>Symphytum sp.</i>
White dead-nettle	<i>Lamium album</i>
Common chickweed	<i>Stellaria media</i>
Greater celandine	<i>Chelidonium majus</i>
Bramble	<i>Rubus fruticosus agg.</i>
Alder	<i>Alnus glutinosa</i>
Red dead-nettle	<i>Lamium purpureum</i>
Rye grass	<i>Lolium perenne</i>
Fescue sp.	<i>Festuca sp.</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Hawthorn	<i>Crataegus monogyna</i>
Field maple	<i>Acer campestre</i>
White poplar	<i>Populus alba</i>
Aspen	<i>Populus tremula</i>
Sycamore	<i>Acer pseudoplatanus</i>
Rose sp.	<i>Rosa sp.</i>
Timothy	<i>Phleum pratense</i>
Cut-leaved cranesbill	<i>Geranium dissectum</i>
Barren brome	<i>Bromus sterilis</i>
Field mustard	<i>Brassica rapa</i>
Cherry	<i>Prunus avium</i>

³⁶ Stace (2019) New Flora of the British Isles 4th edition.

Species name (Stace ³⁶)	Scientific name
Meadow buttercup	<i>Ranunculus acris</i>
Annual meadow-grass	<i>Poa annua</i>

Appendix D. Legislation Table

Species	Legislation	Relevant offences	Licensing procedures and guidance
Bats <i>European protected species</i>	Conservation of Habitats and Species Regulations 2017 (as amended) Reg 43.	Deliberately ³⁷ capture, injure or kill a bat; deliberate disturbance ³⁸ of bats; or damage or destroy a breeding site or resting place used by a bat. [The protection of bat roosts is considered to apply regardless of whether bats are present.]	Mitigation licences issued for development by Natural England (NE). Guidance documents: <i>NE Standing Advice for protected species 2022</i> <i>European Protected Species: Mitigation Licensing - How to get a licence</i> (NE 2013) <i>Bat Mitigation Guidelines</i> (English Nature 2004) <i>Bat Workers Manual</i> (JNCC 2004)
	Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9.	Intentionally kill, injure or take a bat; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or disturb ³⁹ a bat in such a place.	Licence from NE is required for surveys (scientific purposes) that would involve disturbance of bats or entering a known or suspected roost site.
Badgers	Protection of Badgers Act 1992.	Wilfully kill, injure or take a badger; or intentionally or recklessly damage, destroy or obstruct access to a badger sett or disturb a badger in its sett. [It is not illegal to carry out disturbance activities in the vicinity of setts that are not occupied]	Where required, licences for development activities involving disturbance or sett interference or closure are issued by NE. Licences for activities involving watercourse maintenance, drainage works or flood defences are issued under a separate process. Licences are normally not granted from December to June inclusive because cubs may be present within setts. Guidance documents: <i>NE Standing Advice for protected species 2022</i> <i>Badgers & Development</i> (NE 2007)

³⁷ Deliberate capture or killing is taken to include “accepting the possibility” of such capture or killing.

³⁸ Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong.

³⁹ Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2017 (as amended) remain an offence under the Wildlife and Countryside Act 1981 (as amended) although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided.

Species	Legislation	Relevant offences	Licensing procedures and guidance
Birds	Wildlife and Countryside Act 1981 (as amended) Schedule 1 (some species only).	Intentionally kill, injure or take any wild bird; intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; intentionally take or destroy the nest or eggs of any wild bird. Intentionally or recklessly disturb a Schedule 1 species while it is building a nest or is in, on or near a nest containing eggs or young; intentionally or recklessly disturb dependent young of such a species [e.g. most birds of prey, kingfisher, barn owl, black redstart, little ringed plover].	No licences are available to disturb any birds in regard to development. Licences are available in certain circumstances to damage or destroy nests, but these only apply to the list of licensable activities in the Act and do not cover development. General licences are available in respect of 'pest species' but only for certain very specific purposes, e.g. public health, public safety, air safety. Guidance documents: <i>NE Standing Advice for protected species 2022</i>
Adders Common lizards Grass snakes Slow worms	Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9.	Intentionally kill, injure or take any widespread reptile species.	No licence is required ⁴⁰ . However, an assessment for the potential of a site to support reptiles should be undertaken prior to any development works which have potential to affect these animals. Guidance documents: <i>NE Standing Advice for protected species 2022</i>
Butterflies ⁴¹ Moths ⁴² Beetles ⁴³ Bugs ⁴⁴ Crickets ⁴⁵ Dragonflies ⁴⁶ Spiders ⁴⁷	Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9.	Intentionally kill, injure or take; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or to disturb ³⁹ in such a place.	A mitigation licence to cover all Wildlife and Countryside Act 1981 (as amended) offences to these invertebrate species (with the exception of large blue butterfly and Fisher's estuarine moth) can be obtained for projects with reasons of overriding public interest (A05a), or projects which preserve public health and safety, prevent serious damage to livestock, animal feed, crops, growing timber, fisheries or any other property and/or prevent spread of disease (A05).

⁴⁰ Natural England will only consider licence applications to kill or injure reptiles in truly exceptional circumstances. Natural England will not be providing a definition or criteria of what constitutes 'exceptional circumstances' as these applications would need to be assessed on a case-by-case basis. Natural England expects developers and ecologists to continue to adhere to current best practice mitigation measures that avoid injuring and killing reptiles and which do not require a licence.

⁴¹ High brown fritillary, Large blue, Heath fritillary, Swallowtail.

⁴² Reddish buff, Fiery clearwing, Fisher's estuarine moth, Barberry carpet, Black-veined, Sussex emerald, Essex emerald, New Forest burnet.

⁴³ Rainbow leaf beetle, Water beetle *Graphoderus zonatus*, Water beetle *Paracymus aeneus*, Lesser silver water beetle *Hypebaeus flavipes*, Violet click beetle.

⁴⁴ New Forest cicada.

⁴⁵ Wart biter, Mole cricket *Gryllotalpa Gryllotalpa*, Field cricket *Gryllus campestris*.

⁴⁶ Norfolk aeshna, Southern damselfly.

⁴⁷ Fern raft spider, Ladybird spider.

Species	Legislation	Relevant offences	Licensing procedures and guidance
Plants <i>Invasive species, e.g.</i> Japanese knotweed, hybrid knotweed, giant knotweed, giant hogweed, rhododendron, Himalayan balsam	Wildlife and Countryside Act 1981 (as amended) Schedule 9, Section 14.	It is illegal to plant or otherwise cause these species to grow in the wild.	Any contaminated soil or plant material is classified as controlled waste and should be disposed of in a suitably licensed landfill site, accompanied by appropriate Waste Transfer documentation, and must comply with Section 34 of the Environmental Protection Act 1990. Guidance documents: <i>How to stop invasive non-native plants from spreading</i> (Defra and Environment Agency 2022) <i>Guidance on section 14 of the Wildlife and Countryside Act</i> (Defra 2011)

Site Designation	Legislation	Protection	Guidance
Special Protection Area (SPA) Wetland of International Importance (Ramsar site)	Conservation of Habitats and Species Regulations 2017 (as amended) Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (the Ramsar Convention).	Assessment of the implications of plans and projects is effected through Part 6 of the Conservation of Habitats and Species Regulations 2017 (as amended), in particular Regs 61 – 69. The legislation for the Sites of Special Scientific Interest which underpin each designation also applies. These sites are given protection through policies in the Local Development Plan.	Formal Appropriate Assessment is required to be undertaken by the competent authority before undertaking, or giving consent, permission or other authorisation for a plan or project which is likely to have a significant effect on such a site. Guidance documents: <i>The National Planning Policy Framework</i> (Department for Communities and Local Government, July 2021), with particular reference to Policy 15 Conserving and enhancing the natural environment. <i>The Government Circular: Biodiversity and Geological Conservation - Statutory Obligations and their Impact within the Planning System</i> (ODPM Circular 6/2005 & Defra Circular 01/2005) (the joint Circular). <i>The Habitats Regulations Assessment Handbook</i> , DTA Publications Ltd.
Site of Special Scientific Interest (SSSI)	Wildlife and Countryside Act 1981 (as amended)	It is an offence to carry out or permit to be carried out any potentially damaging operation. SSSIs are given protection through policies in the Local Development Plan.	Owners, occupiers, public bodies and statutory undertakers must give notice and obtain the appropriate consent under Section 28 before undertaking operations likely to damage a SSSI. Section 28G places a duty on all public bodies to further the conservation and enhancement of SSSIs. Guidance documents: <i>The National Planning Policy Framework</i> (Department for Communities and Local Government, July 2021), with particular reference to Policy 15, and the joint Circular.
Local Sites (e.g. County Wildlife Sites, Sites of	There is no statutory designation for local sites.	Local sites are given protection through policies in the Local Development Plan.	Development proposals that would potentially affect a local site would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged.

Importance for
Nature
Conservation)

Guidance documents: The *National Planning Policy Framework* (Department for Communities and Local Government, July 2021), with particular reference to Policy 15, and the joint Circular.

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