

National Grid Cable Tunnel Replacement Project

Biodiversity Net Gain Assessment and Strategy Report (Revision 1)

July 2024

Quality information

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1. Introduction

- 1.1.1 AECOM was commissioned by National Grid (hereafter referred to as the 'Client') to undertake a Biodiversity Net Gain (BNG) assessment at two locations north and south of the River Thames, located at Tilbury (hereafter referred to as the 'Tilbury Site') and Gravesend (hereafter referred to as the 'Gravesend Site'). The assessment encompasses works at both Tilbury and Gravesend therefore the two in combination are hereafter referred to as the 'Site'. Any assessment or discussions specific to one location will be identified by utilisation of the terms 'Tilbury' and 'Gravesend'. The BNG assessment is intended to inform the planning application for the Tilbury to Grain and Tilbury to Kingsnorth (TKRE) Cable Tunnel Replacement Project (hereafter referred to as the 'Proposed Development').
- 1.1.2 The BNG assessment has been undertaken to quantify the overall effect of the Proposed Development upon both Site's biodiversity value. This is achieved by comparing the Site's baseline habitat value with that of the Proposed Development. Calculations consider the level of proposed habitat loss, retention, enhancement and/or creation delivered by the Proposed Development and are measured using Natural England's Biodiversity Metric 4.0¹ in accordance with associated guidance documents² and best practice principles³. The report sets out the results of the BNG assessment including the methodology in Section 2, the results in Section 3, the recommendations in Section 4, and the conclusions in Section 5.

1.2 Site Description

Tilbury Site

- 1.2.1 The area north of the river is in Tilbury in the borough of Thurrock, Essex at Ordnance Survey (OS) Grid Reference TQ 66397 75618. The land on the Tilbury Site is a mixture of in-use and disused industrial grounds. The western parts of the Site include grassland, scrubland, bare ground, ditches and short ephemeral vegetation. The eastern parts of the Site consist of bare ground with no vegetation and large areas of unconsolidated sandy/silty soils.
- 1.2.2 The Site is surrounded by an industrial and agricultural landscape with the River Thames adjacent to the south. The wider landscape includes Tilbury town to the north-west of the Site.

Gravesend Site

- 1.2.3 The area to the south of the river is located in Gravesend, in the borough of Gravesham, Kent at OS Grid Reference TQ 67659 74153. The habitats on Site include grassland, scrubland, bare ground, ditches and marshy grassland. The majority of the Site is within Milton Rifle Range, with the wider landscape consisting of agricultural fields, and an industrial area. The main town is located to the west. The River Thames adjoins the northern boundary and the Thames and Medway Canal runs along the southern boundary.

1.3 Proposed Development

- 1.3.1 The Proposed Development (presented in the 'Post Development Plan' shown in Appendix B) relates to the replacement of the cabled section of the TKRE 400 kV circuits only. It is proposed that a new

¹ Natural England (2023). [The Biodiversity Metric 4.0](#).

² Natural England (2023). The Biodiversity Metric 4.0 – [User Guide](#), [Technical Annex 1](#) & [Technical Annex 2](#).

³ CIEEM, IEMA & ciria (2019). [Biodiversity Net Gain: Good Practice Principles for Development, A Practical Guide](#)

bored tunnel under the River Thames is constructed, and new XLPE cables installed as well as new associated new infrastructure either side comprising:

- A new tunnel underneath the River Thames;
- Two new headhouses;
- Two Sealing End Compounds (SECs); and
- Overhead line re-stringing to connect the overhead lines to the new SECs.

1.3.2 Each required headhouse and SEC would fall within either Thurrock Council or Gravesham Borough Council's jurisdiction.

1.4 Policy context

National Legislation

1.4.1 It is government policy that “*planning decisions should minimise impacts on and provide net gain for biodiversity*”⁴. The Environment Act⁵ includes provisions to make BNG a mandatory requirement within the planning system in England. Amendments to the Town and Country Planning Act⁶, occurred from February 2024 and require all relevant developments to achieve a minimum 10% net gain in biodiversity units relative to the site's baseline biodiversity value.

1.4.2 It should be noted, that this planning application was submitted prior to the implementation of this legislation (February 2024) and therefore the net gain presented sits outside of the legislative regime and requirement to provide the minimum of 10% net gain.

Local Planning Policy

1.4.3 The Proposed Development is situated within two council boundaries, Gravesham Borough Council and Thurrock Council.

1.4.4 Gravesham Local Plan Core Strategy⁷ includes the Policy CS12: Green Infrastructure relevant to BNG, which states:

“There will be no net loss of biodiversity in the Borough, and opportunities to enhance, restore, re-create and maintain habitats will be sought, in particular within the Biodiversity Opportunity Areas shown on the Strategic Green Infrastructure Network map and within new development.”

1.4.5 Whereas, Thurrock's Core Strategy and Policies for Management of Development (as amended) Adopted January 2015⁸ includes Policy CSTP19 – Biodiversity relevant to BNG, which states:

“The substantial growth planned for the Borough should not be to the detriment of the biodiversity of the area. New development should understand and respect this, and not lead to any net loss of species or habitats”

Minimum BNG Requirement

⁴ UK Government (2023). [National Planning Policy Framework](#), section (d) of paragraph 174

⁵ UK Government (2021). [The Environment Act](#)

⁶ UK Government (1990). [Town and Country Planning Act](#)

⁷ Gravesham Borough Council (2014). Gravesham Local Plan Core Strategy. Accessed: [Local plan – Gravesham Borough Council](#)

⁸ Thurrock Council (2015). The Core Strategy and Policies for Management of Development (as amended) Adopted January 2015. Accessed: [Thurrock Council - Core Strategy and Policies for Management of Development \(as amended\), adopted January 2015](#)

- 1.4.6 The Gravesham Local Plan Core Strategy⁹ and Thurrock's Core Strategy and Policies for Management of Development (as amended) Adopted January 2015¹⁰ do not specify a net gain target, however, National Grid internal policy is to achieve a minimum 10% net gain. Therefore, as a minimum, the Proposed Development will be seeking to achieve a 10 % net gain in biodiversity to align with National Grid's internal policy.

2. Methodology

2.1 Biodiversity Metric 4.0

- 2.1.1 The BNG assessment involves making a comparison between the biodiversity value of habitats present within the Site prior to development (i.e., the 'baseline') and the predicted biodiversity value of habitats following the completion of the development (i.e., 'post-development'). The comparison is made in terms of 'biodiversity units', with a 'biodiversity metric' providing the mechanism to allow biodiversity values to be calculated and compared.
- 2.1.2 Biodiversity Metric 4.0¹ calculates the overall loss or gain of biodiversity of development projects by assessing the distinctiveness (i.e., type of habitat and its value), condition, extent, and strategic significance of habitats on site pre- and post-development, including both permanent and temporary land-take areas. To achieve BNG, the biodiversity unit score must have a post-development score higher than the baseline score.
- 2.1.3 When calculating the post-development biodiversity units, the Biodiversity Metric 4.0¹ includes a series of standard 'risk multipliers' to account for the inherent risk of creating and restoring habitats, the time taken to establish habitats and the location of the mitigation in relation to the habitats lost on site. The risk multipliers have the effect of reducing the value of the proposed habitats, which means that larger areas, habitats of higher distinctiveness, and/or condition than the baseline are required to mitigate for losses and achieve net gain.
- 2.1.4 The Biodiversity Metric 4.0¹ assesses and generates separate outputs for area-based habitats¹¹ (measured in habitat units) and linear based habitats, including hedgerows (measured in hedgerow units) and watercourses (measured in watercourse units). To claim a net gain in biodiversity, there must be an increase across all habitats, hedgerow and river units, the units cannot be summed to give an overall biodiversity unit value i.e., an increase in habitat and hedgerow units cannot be used to offset a loss in watercourse units.
- 2.1.5 The information required to undertake the calculation is described below.

Baseline Data

- 2.1.6 UKHab Survey data collected by AECOM in November 2022 and a further visit to the Gravesend Site in January 2023¹² (hereafter referred to as the 'baseline') have been utilised to determine the baseline area-based hedgerow and watercourse habitats. The baseline habitats were converted from standard UKHab Classification categories¹³ to the specific BNG habitats (Appendix C.1) before being digitised in Geographic Information System (GIS) to provide area and length measurements of each habitat type.

⁹ Gravesham Borough Council (2014). Gravesham Local Plan Core Strategy. Accessed: [Local plan – Gravesham Borough Council](#)

¹⁰ Thurrock Council (2015). The Core Strategy and Policies for Management of Development (as amended) Adopted January 2015. Accessed: [Thurrock Council - Core Strategy and Policies for Management of Development \(as amended\), adopted January 2015](#)

¹¹ This includes all area-based terrestrial and intertidal habitats. All habitats from the low water mark to the high-water mark can and should be assessed using Metric 4.0 where they are impacted by development. Any marine habitats beyond the low water mark cannot be assessed using Metric 4.0.

¹² AECOM (2023). TKRE Preliminary Ecological Appraisal Report.

¹³ UKHab Ltd (2018 – 2023). [UK Habitat Classification](#).

- 2.1.7 All baseline habitats defined within the Site were assigned a condition using the condition assessment criteria outlined in the Biodiversity Metric 4.0 guidance documents², by a qualified ecologist. Individual trees were not condition assessed at the time of survey and have therefore been condition assessed retrospectively. Further detail on habitat condition scores is provided in Appendix D. The data was aggregated and entered into the Biodiversity Metric 4.0¹ to calculate the baseline biodiversity units.
- 2.1.8 Off-site habitats are assessed utilising the same process as above however off-site areas may be subject to a negative spatial risk multiplier within the metric depending on the location. If the off-site compensation Site is within the LPA boundary or National Character Area (NCA)¹⁴ a multiplier of 1 is applied to the unit value (which has no impact on the score). If the off-site compensation Site is outside of both LPA and NCA boundaries but is in the neighbouring LPA or NCA, a multiplier of 0.75 is applied to the unit value. If the off-site compensation Site is outside of the LPA and NCA and is not in the neighbouring of either a multiplier of 0.5 is applied to the unit value.

Post-Development Data

- 2.1.9 The Outline Landscape and Ecology Plans in Appendix A of the Outline Landscape and Ecological Management Plan¹⁵ has been used to determine the extent and type of habitats to be retained, created and enhanced post-development. Habitats in the Outline Landscape Masterplans¹⁵ were converted to UKHab Classification categories¹³ (Appendix C.2) before being digitised into GIS to produce the 'Post-Development Plan' (Appendix B). Target condition scores for the proposed habitats were selected in accordance with Biodiversity Metric 4.0 guidance documents² using professional judgement to ensure the condition scores selected were realistic. The data was utilised to predict the post development biodiversity units.

Strategic Significance

- 2.1.10 Biodiversity Metric 4.0¹ requires that the strategic significance (hereafter referred to as 'SS') of all baseline and post-development habitats be defined. SS refers to strategic locations for local biodiversity and nature improvements, identified within local planning policies. The process of how the SS of a habitat is assessed is shown in Figure 1.

¹⁴ [National Character Area profiles - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/collections/national-character-area-profiles)

¹⁵ AECOM (2023). TKRE Outline Landscape and Ecological Management Plan (60677311-ACM-00-XX-DR-LA-000001/2)

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graph TD
    Q1[Does the habitat fall within a mapped biodiversity opportunity area/conservation target area/area identified in the biodiversity action plan?]
    Q2[Is the habitat identified within a local plan, strategy, or policy an ecologically important or a priority habitat?]
    Q3[Based on information gathered during ecology surveys, has the habitat been identified as locally ecologically important?]
    Q4[Does the habitat provide an important linkage between other strategically valuable habitats?]
    Q5[Where no relevant plan, strategy, or policy is in place, using professional judgement, is there any reason to assign higher than 'Low' strategic significance?]
    Q6[Is the habitat identified within a local plan, strategy, or policy an ecologically important or a priority habitat?]
    Q7[Based on information gathered during ecology surveys, has the habitat been identified as locally ecologically important?]
    Q8[Does the habitat provide an important linkage between other strategically valuable habitats?]
    Q9[Where no relevant plan, strategy, or policy is in place, using professional judgement, is there any reason to assign higher than 'Low' strategic significance?]

    Q1 -- YES --> Q2
    Q1 -- NO --> Q6
    Q2 -- YES --> HSS[High SS]
    Q2 -- NO --> Q3
    Q3 -- YES --> HSS
    Q3 -- NO --> Q4
    Q4 -- YES --> MSS[Medium SS]
    Q4 -- NO --> Q5
    Q5 -- YES --> MSS
    Q5 -- NO --> LSS[Low SS]
    Q6 -- YES --> HSS
    Q6 -- NO --> Q7
    Q7 -- YES --> HSS
    Q7 -- NO --> Q8
    Q8 -- YES --> MSS
    Q8 -- NO --> Q9
    Q9 -- YES --> MSS
    Q9 -- NO --> LSS
  
```

Does the habitat fall within a mapped biodiversity opportunity area/conservation target area/area identified in the biodiversity action plan?

YES

Is the habitat identified within a local plan, strategy, or policy an ecologically important or a priority habitat?

YES

High SS

NO

Based on information gathered during ecology surveys, has the habitat been identified as locally ecologically important?

YES

High SS

NO

Does the habitat provide an important linkage between other strategically valuable habitats?

YES

Medium SS

NO

Where no relevant plan, strategy, or policy is in place, using professional judgement, is there any reason to assign higher than 'Low' strategic significance?

YES

Medium SS

NO

Low SS

Does the habitat fall within a mapped biodiversity opportunity area/conservation target area/area identified in the biodiversity action plan?

NO

Is the habitat identified within a local plan, strategy, or policy an ecologically important or a priority habitat?

YES

High SS

NO

Based on information gathered during ecology surveys, has the habitat been identified as locally ecologically important?

YES

High SS

NO

Does the habitat provide an important linkage between other strategically valuable habitats?

YES

Medium SS

NO

Where no relevant plan, strategy, or policy is in place, using professional judgement, is there any reason to assign higher than 'Low' strategic significance?

YES

Medium SS

NO

Low SS

If so, specify the reasoning for this in the report.

If so, specify the reasoning for this in the report.

- Gravesham Local Plan Core Strategy (2014)⁷
- Gravesham Local Plan Policies Map¹⁶
- Thurrock Council The Core Strategy and Policies for Management of Development (as amended) 2015⁸
- Preliminary Ecological Appraisal (AECOM, 2023)¹⁷
- Thurrock Council Core Strategy Policies Map¹⁸
- Thurrock Biodiversity Action Plan 2007-2012¹⁹
- Multi-Agency Geographic Information for the Countryside (MAGIC)²⁰

BNG Good Practice Principles for Development

Assumptions

- The majority of habitats underneath new overhead lines are expected to be impacted minimally and for a short amount of time and have therefore been assessed as retained within the metric;

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- The total construction period of the works is 4 years. Therefore, habitats to be temporarily lost for the duration of works (2024/25-2028) are subject to a 2-year delay in creation, this is in addition to the two-year grace period that the metric allows for, therefore resulting in a four year delay for habitat creation (2028) from the date of works commencement (late 2024/early 2025);
- Service diversions at Tilbury are expected to impact narrow areas of grassland for a short amount of time (approximately 2-3 weeks), turf will be lifted and stored to be reinstated as soon as possible, therefore this habitat has been assessed as retained;
- A current access road to the north of Tilbury is to be used with a temporary extension that will encroach the proposed Site of Special Scientific Interest (SSSI) this temporary encroachment has not been considered in this assessment due to the SSSI status only being a proposal. However, if the SSSI status is confirmed, an updated BNG assessment will be required;
- All ditches are retained and not negatively impacted throughout the duration of the development and operation phases of the Proposed Development; and
- No watercourse or riparian zone encroachment will occur. Moreover, commitment is made in the Outline CEMP (ES Volume IV Appendix 3.1) to keep at least 5m away from watercourses, ditches and barriers is shown on the indicative construction compound layouts (see ES Volume II Chapter 3: Project Description). It should be noted that an exception to this is the creation of a small headwall at Tilbury to allow for drainage into the existing ditch during operation. A suitable location is to be found for this which either avoid water vole activity or an ecologist with a class licence will displace any water vole into adjacent habitat through clearing a small area of vegetation temporarily.

Constraints or limitations

2.1.15 The following limitations also apply:

- All habitat areas and lengths have been measured manually using ArcGIS based on the UKhab Plan and the Outline Landscape and Ecological Management Plans¹⁴. As such, habitat areas are approximations only.

3. Results

3.1 Baseline Habitats

- 3.1.1 The above-ground Site covers a total area of 20.20 ha including both Gravesend and Tilbury. The habitats identified on Site vary in ecological value, ranging from Very Low to High distinctiveness. The most dominant habitat on site is Urban – Developed land sealed surface at Tilbury. Additionally, there are several ditches present on site. The 'Baseline Habitat Plan' is provided in Appendix A. Detailed descriptions of each baseline habitat is present in Appendix E.
- 3.1.2 Trees are also present within the baseline including three classified as 'medium' size (diameter at breast height (DBH) of >30cm and <90cm) at Tilbury and one classified as 'small' (>7cm and <30cm) at Gravesend. In addition to these four, one tree was identified as a veteran tree within the Arboricultural Impact Assessment (AIA)²¹ included in the planning application at the Gravesend Site. Veteran trees are classified as irreplaceable habitat and therefore must be retained. To capture this, the veteran tree has been assessed in isolation to the other trees within the Site and has been retained. Trees have all have been assigned a Moderate condition retrospectively on a precautionary basis.

Baseline Habitats – Strategic Significance

- 3.1.3 As outlined in Section 2.1.3, Strategic Significance (SS) has been assigned to all baseline habitats present within the Site:
- 'High' SS has been assigned to all naturalised habitats as the entire Site is present within the Network Enhancement Zone (this is a map of combined habitat networks that have associated suggestions for biodiversity enhancement); and
 - "Low' SS has been assigned to non-naturalised habitats due to their lack of ecological value.

Baseline Habitat Units

- 3.1.4 The baseline biodiversity value was calculated as 83.92 units for area-based habitats (Table 1), and 1.58 for river habitats (Table 2).

Table 1. Baseline Area-Based Habitats

Broad Habitat	Habitat type	Area (ha)	Distinctiveness	Condition	SS	Habitat Units
Grassland	Modified grassland	2.053	Low	Poor	High	4.72
Grassland	Modified grassland	0.187	Low	Moderate	High	0.86
Grassland	Other neutral grassland	4.481	Medium	Moderate	High	41.23
Heathland and shrub	Bramble scrub	0.111	Medium	Condition Assessment N/A	High	0.51
Heathland and shrub	Mixed scrub	2.643	Medium	Moderate	High	24.32

²¹ TKRE Arboricultural Impact Assessment, AECOM (2023)
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Broad Habitat	Habitat type	Area (ha)	Distinctiveness	Condition	SS	Habitat Units
Sparsely vegetated land	Ruderal/Ephemeral	0.757	Low	Moderate	High	3.48
Urban	Artificial unvegetated, unsealed surface	0.206	V. Low	N/A – Other	V. Low	0.00
Urban	Developed land; sealed surface	11.166	V. Low	N/A – Other	V. Low	0.00
Wetlands	Reedbeds	0.592	High	Moderate	High	8.17
Individual trees	Rural tree	0.0531*	Medium	Moderate	High	0.49
Individual trees	Rural tree (veteran)	0.016*	Medium	Moderate	High	0.15
Total	-	22.20	-	-	-	83.92

*Individual tree – Rural tree' areas are excluded from total area to prevent double counting of area; however, the unit contributions are included within the habitat unit total.

Table 2. Baseline Watercourse Habitats

Habitat type	Length (km)	Distinctiveness	Condition	SS	Watercourse Units
Ditches	0.344	Medium	Poor	High	1.58
Total	0.344	-	-	-	1.58

3.2 Post-Development Habitats

- 3.2.1 The Post-Development Plan includes the creation of Urban, Grassland, Wetland, Heathland and Shrub habitats. The habitats identified on Site post-development vary in ecological value, ranging from Very Low to High distinctiveness. The post-development habitats for both Tilbury and Gravesend are shown on the 'Post-Development Plan' in Appendix B.
- 3.2.2 Due to the scope of works resulting in habitats associated with the overhead line installation being minimally impacted and for a short amount of time (approx. 2-3 weeks for overhead line (OHL) installation), the habitats solely within the OHL working areas have been assessed as retained.
- 3.2.3 Both Site locations will have temporary construction compounds in place for four years (approximate dates are 2024 – 2028), this comprises the majority of the Site at Gravesend. In this case, habitats will be reinstated (created) with a two-year delay. This is in addition to the two-year development period that is allowed for in the metric resulting in the total delay in creation being four years from the commencement of works accounting for the 2024 – 2028 construction period. These habitats will be replaced on a like-for-like basis in all cases apart from the baseline 'Bramble scrub' being reinstated as 'Mixed scrub', at the Gravesend Site, to be in keeping with the majority of the scrub within the Site whilst providing a higher value habitat.

Post-Development Habitats – Strategic Significance

- 3.2.4 As outlined in Section 2.1.3, SS has been assigned to all post-development habitats proposed within the Post-Development Plan:
- “High’ SS has been assigned to all naturalised habitats as the Site is present within the Network Enhancement Zone; and
 - “Low’ SS has been assigned to non-naturalised habitats due to their lack of ecological value.
- 3.2.5 The high-level management prescriptions required for the created and enhanced habitats to reach their target condition in the specified timeframe is provided in Appendix G below.

Retained Habitats

- 3.2.6 Habitats that are due to be retained within the Proposed Development are detailed in Table 3 and Table 4. In total, 18.08 ha of area based habitats and 0.34 km of watercourse habitats are due to be retained with a biodiversity unit value of 55.50 area based units and 1.58 watercourse units. The watercourses within the Sites cannot be enhanced as part of the Proposed Development as they are not within the red line boundary for the Proposed Development.

Table 3. Retained Area-Based Habitats

Broad habitat	Habitat type	Area (ha)	Distinctiveness	Condition	SS	Area-based Units
Grassland	Modified grassland	1.877	Low	Poor	High	4.32
Grassland	Modified grassland	0.182	Low	Moderate	High	0.84
Grassland	Other neutral grassland	2.381	Medium	Moderate	High	21.91
Heathland and shrub	Bramble scrub	0.026	Medium	Condition Assessment N/A	High	0.12
Heathland and shrub	Mixed scrub	2.158	Medium	Moderate	High	19.85
Sparsely vegetated land	Ruderal/Ephemeral	0.191	Low	Moderate	High	0.88
Urban	Artificial unvegetated, unsealed surface	0.206	V.Low	N/A - Other	V.Low	0.00
Urban	Developed land; sealed surface	10.505	V.Low	N/A - Other	V.Low	0.00
Wetlands	Reedbeds	0.539	High	Moderate	High	7.44
Individual trees	Rural tree (veteran)	0.016*	Medium	Moderate	High	0.15
Total		18.08	-	-		55.05

*Individual tree – Rural tree’ areas are excluded from total area to prevent double counting of area; however, the unit contributions are included within the habitat unit total.

Table 4. Retained Watercourse Habitats

Habitat type	Length (km)	Distinctiveness	Condition	SS	Watercourse Units
Ditches	0.344	Medium	Poor	High	1.58
Total	0.344	-	-	-	1.58

Onsite Created Habitats

Habitats that are due to be created within the Proposed Development are detailed in Table 5 and

- 3.2.7 Table 6.
- 3.2.8 In total, 4.13 ha of area-based habitats are proposed to be created onsite, this results in a biodiversity unit value of 17.09 habitat units.
- 3.2.9 In total, 0.167 km of hedgerow habitats are proposed to be created onsite (a line of trees), resulting in a unit value of 0.35 units.
- 3.2.10 The majority of habitats have been assigned a two-year delay in habitat creation. This is due to the 2024 – 2028 construction period with the allowance of a two-year construction period within the metric.
- 3.2.11 Habitats to be created include those present within the Baseline with additional 'Urban – Other green roof' and 'Urban – Sustains drainage system'. The 'Urban – Other green roof' will be created as a biodiverse brown roof however, this is not a defined habitat within the metric and has therefore been assigned the closest applicable habitat type (Other green roof). A line of trees is to be created along the southern boundary of Gravesend to provide screening.

Table 5. Onsite Created Area-Based Habitats

Broad Habitat	Habitat type	Area (ha)	Distinctiveness	Target Condition	SS	Delay in starting habitat creation (yrs)	Time to target condition (yrs)**	Habitat Units
Urban	Artificial unvegetated, unsealed surface	0.062	V. Low	N/A - Other	Low	-	0	0.00
Urban	Developed land; sealed surface	1.173	V. Low	N/A - Other	Low	-	0	0.00
Grassland	Other neutral grassland	2.115	Medium	Moderate	High	2	5	13.19
Heathland and shrub	Mixed scrub	0.207	Medium	Moderate	High	2	5	1.48
Sparsely vegetated land – Ruderal/Ephemeral	Ruderal/Ephemeral	0.223	Low	Moderate	High	2	3	0.86

Broad Habitat	Habitat type	Area (ha)	Distinctiveness	Target Condition	SS	Delay in starting habitat creation (yrs)	Time to target condition (yrs)**	Habitat Units
Urban	Other green roof	0.07	Low	Condition Assessment N/A	High	2	1	0.13
Urban	Sustainable drainage system	0.122	Low	Moderate	High	2	3	0.31
Wetland	Reedbeds	0.046	High	Moderate	High	2	7	0.31
Wetland	Reedbeds	0.062	High	Moderate	High	2	7	0.42
Individual trees	Rural tree	0.024*	Medium	Moderate	High	2	27	0.08
Wetland	Reedbeds	0.05	High	Moderate	High	2	7	0.34
Total		4.13	-	-	-		-	17.09

*Individual tree – Rural tree' areas are excluded from total area to prevent double counting of area; however, the unit contributions are included within the habitat unit total.

This column **does not include delay years; this is time to target condition from the time of creation.

Table 6. Created Hedgerow Habitats

Hedgerow type	Area (ha)	Distinctiveness	Target Condition	SS	Delay in starting habitat creation (yrs)	Time to target condition (yrs)	Habitat Units
Line of trees	0.167	Low	Moderate	High	2	22	0.35

3.3 Summary of Results

- 3.3.1 All baseline habitats and habitats created and retained are present within the accompanying Biodiversity Metric 4.0¹ assessment for the Proposed Development (Appendix I).
- 3.3.2 A summary of the results is shown in Table 7. Based on the current Post-Development Plan, the Proposed Development is predicted to result in a net loss of -11.33 habitat units (-13.50%), a net gain of 0.35 hedgerow units and no net change for watercourse units (0.00%). Hedgerow habitats do have a net gain in regard to units, however, a percentage increase cannot be calculated due to their being no hedgerow units at baseline.

Table 7. Summary of Results

Habitat Type	Baseline	Post-Development	Total Net Unit Change	Total Net % Change
Area-Based Units	83.92	72.59	-11.33	-13.50%

Habitat Type	Baseline	Post-Development	Total Net Unit Change	Total Net % Change
Hedgerow Units	0.00	0.35	0.035	N/A
Watercourse Units	1.58	1.58	0.00	0.00%

Trading Rules

- 3.3.3 The trading rules within the Biodiversity Metric 4.0¹ are a set of rules that try to prevent the ‘trading down’ of habitat distinctiveness. Under the trading rules losses of habitat are to be compensated for on a “like for like” or “like for better” basis.

Trading Rules Summary – Area-Based Habitats

- 3.3.4 For area-based habitats, the trading rules within the Biodiversity Metric 4.0¹ are currently satisfied for high distinctiveness habitats but are not satisfied for other relevant distinctiveness groups (see Table 8). This failure of the trading rules is caused by full or partial loss of all habitats which have not been directly mitigated for by the Proposed Development, excluding ‘Wetland– Reedbeds.

Table 8. Trading Rules Summary – Area-Based Habitats

Broad Habitat	Habitat Type	Distinctiveness Group	Trading Rule	Unit Change per habitat	Unit change per habitat group	Trading Satisfied?
Wetland	Reedbeds	High	Same habitat required	0.33	0.33	Yes
Grassland	Other neutral grassland	Medium	Same broad habitat or a higher distinctiveness habitat required	-6.13	-3.36	No
Heathland and shrub	Bramble scrub			-0.39		
Heathland and shrub	Mixed scrub			-2.98		
Individual trees	Rural tree			-0.41		
Grassland	Modified grassland	Low	Same distinctiveness or better habitat required	-0.43	-1.71	No
Sparsely vegetated land	Ruderal/ephemeral			-1.75		
Urban	Other green roof			0.13		
Urban	Sustainable urban drainage feature			0.30		
Total				-11.33	-11.33	

Trading Rules Summary - Hedgerow Habitats

- 3.3.5 For hedgerow habitats, the trading rules within the Biodiversity Metric 4.0¹ are currently satisfied for the distinctiveness group²² (see Table 9).

Table 9. Trading Rules Summary – Hedgerow Habitats

Hedgerow Type	Distinctiveness Group	Trading Rule	Unit Change per habitat	Unit change per habitat group	Trading Satisfied?
Line of trees	Low	Same distinctiveness or better habitat required	0.35	0.35	Yes
-	-	-	0.35	0.35	-

Trading Rules Summary - Watercourse Habitats

- 3.3.6 For watercourse habitats, the trading rules within the Biodiversity Metric 4.0¹ are currently satisfied for the relevant distinctiveness group (see Table 10).

Table 10. Trading Rules Summary – Hedgerow Habitats

Watercourse Type	Distinctiveness Group	Trading Rule	Unit Change per habitat	Unit change per habitat group	Trading Satisfied?
Ditches	Low	Same distinctiveness or better habitat required	0.00	0.00	Yes
-	-	-	0.00	0.00	-

²² Distinctiveness levels are graded from Very Low to Very High, with very low being land with no habitat value to very high included extremely rare habitats.

4. On-Site Summary

- 4.1.1 Based on the results of the assessment, further habitat creation is required in order to achieve 10% BNG as per National Grid's internal target. This further habitat creation would enable National Grid to satisfy the trading rules for Medium and Low distinctiveness groups. In accordance with best practice, the delivery of habitat enhancement measures should be designed to mitigate for the impacts of the Proposed Development by following the mitigation hierarchy (avoid, minimise and mitigate as a last resort) and contributing to local ecological priorities.
- 4.1.2 A number of alterations were made to the design of the Proposed Development to ensure the minimum amount of habitat disturbance and loss on the Sites, whilst ensuring there is no loss of High distinctiveness habitats ('Wetland – Reedbed'). National Grid have maximised all available opportunities for BNG on Site, and so further offsite options must be explored.
- 4.1.3 The total baseline habitat units on the Sites are 83.92 area-based habitat units, 0.35 hedgerow units and 1.58 watercourse units, this means that to achieve the minimum BNG target of 10%, the Proposed Development needs to provide at least 92.31 area-based units and 0.16 watercourse units. Therefore, in addition to the units currently being provided by the Proposed Development, to achieve the BNG target a minimum of 19.72 additional area-based habitat units and 0.16 additional watercourse units whilst no further hedgerow units are required (see Table 11).
- 4.1.4 Although there is an absence of watercourse units provided by the Proposed Development, there are to be no impacts to any of the ditches within the red line boundary. In addition, it may not possible to enhance any of the ditches within the Sites. The Environment Agency manage the ditches at Gravesend (which are designated Main Rivers) and need to access them for maintenance. The ditches at Tilbury are privately owned and not managed by National Grid. Therefore, it is considered that the 0.16 units should not be a mandatory provision.

Table 11. Additional units required to achieve BNG

Area/Linear Units	Baseline	Post-development	Total net unit change	Total net % change	Units required to achieve 10% BNG
Habitat units	83.92	72.59	-11.33	-13.50%	19.72
Hedgerow units	0.00	0.35	0.35	N/A	N/A
Watercourse units	1.58	1.58	0.00	0.00	0.16*

*As detailed in Section 4 above, it should be considered as to whether additional watercourse units are required due to the absence for ditch impacts and third-party ownership of all watercourses in question.

5. Off-Site Biodiversity Net Gain Opportunities

5.1 Offsetting Opportunities for Area-Based Habitats

- 5.1.1 Following the On-Site biodiversity net gain assessment which identifies a net loss of -11.33 habitat units, opportunities for enhancement have focused on both increasing the unit score (a total of 19.72 units are required to achieve 10% net gain) whilst also satisfying the trading rules. National Grid internal policy is to achieve a minimum 10% net gain (aligning with national policy).
- 5.1.2 To satisfy the trading rule for 'Medium' distinctiveness habitats, an area comprising of 'Grassland – Other neutral grassland', 'Heathland and shrub – Mixed scrub/ Bramble scrub' and 'Individual trees – Rural tree' or that of another medium distinctiveness grassland habitats or a higher distinctiveness habitat must be created and/or enhanced.
- 5.1.3 In order to satisfy the 'Low' distinctiveness trading rule areas of 'Grassland – Modified grassland' or 'Sparsely vegetated land – Ruderal/Ephemeral' or any habitat that provides the required units must be created and/or enhanced. National Grid have had ongoing discussions with The Royal Society for the Protection of Birds (RSPB) since October 2023. These discussions have identified a number of RSPB owned areas that appear suitable for BNG offsetting/environmental enhancement whilst also achieving RSPB aspirations.
- 5.1.4 The following two RSPB project areas have been identified as being suitable to provide the BNG requirements National Grid requires::
- **Shorne Reedbed:** This site is located adjacent to the Gravesend Site on the eastern boundary. The RSPB aspires to enhance the condition of the current reedbed by reducing the bed level and increasing water retention. This will create a reedbed more favourable to wildlife whilst also having the potential to move water to the adjacent grassland creating a larger wet environment.
 - **Cliffe Pools Scrub:** This site is located to the northeast of the Gravesend Site and is largely dominated by scrub. RSPB have identified its importance due to the population of Nightingale *Luscinia megarhynchos* that utilise the habitat. However, the population is at risk due to habitat decline and therefore enhancing the scrub to support this species would be advantageous.
- 5.1.5 Site visits to both sites were carried out in May 2024 by AECOM to identify the habitats present at baseline. Further information was obtained from RSPB on the water table of Shorne Reedbed throughout the year to accurately determine the condition of the reedbeds present.

6. Offsite Results

6.1 Baseline Habitats

- 6.1.1 The above-ground Site covers a total area of 11.48 ha including both Cliffe Pools Scrub and Shorne Reedbed. The habitats identified on Site vary in ecological value, ranging from Low to V. High distinctiveness. Details of the baseline area-based habitats present and the unit value they provide are show in Table 12 below whilst details for hedgerow-based habitats and watercourse-based habitats are show in in Tables 13 and 14 respectively.

Baseline Habitats – Strategic Significance

6.1.2 As outlined in Section 2.1.3, Strategic Significance (SS) has been assigned to all baseline habitats present within the Site:

- ‘High’ SS has been assigned to all naturalised habitats as the entire Site is present within the Network Enhancement Zone (this is a map of combined habitat networks that have associated suggestions for biodiversity enhancement); and
- “Low’ SS has been assigned to non-naturalised habitats due to their lack of ecological value.

Baseline Habitat Units

6.1.3 The baseline biodiversity value was calculated as 101.19 units for area-based habitats (Table 12), 3.95 units for hedgerow habitats (Table 13) and 3.97 for watercourse habitats (Table 14).

Table 12. Baseline Area-Based Habitats

Broad Habitat	Habitat type	Area (ha)	Distinctiveness	Condition	SS	Habitat Units
Urban	Bare ground	0.35	Low	Poor	High	0.81
Grassland	Modified grassland	1.12	Low	Poor	High	2.58
Heathland and shrub	Bramble scrub	3.828	Medium	Condition Assessment N/A	High	17.61
Wetland	Reedbeds	0.571	High	Moderate	High	7.88
Heathland and shrub	Mixed scrub	0.171	Medium	Moderate	High	1.57
Heathland and shrub	Mixed scrub	0.012	Medium	Poor	High	0.06
Grassland	Other neutral grassland	1.242	Medium	Moderate	High	11.43
Grassland	Other neutral grassland	0.219	Medium	Poor	High	1.01
Lakes	Aquifer fed naturally fluctuating water bodies	0.547	V. High	Good	High	15.10
Wetland	Reedbeds	2.912	High	Moderate	High	40.19
Wetland	Reedbeds	0.312	High	Poor	High	2.15
Urban	Bare ground	0.032	Low	Poor	High	0.07
Heathland and shrub	Bramble scrub	0.162	Medium	Condition Assessment N/A	High	0.75
Wetland	Reedbeds	0	High	Moderate	High	0.00
Total		11.48				101.19

Table 13. Baseline Hedgerow Habitats

Habitat type	Length (km)	Distinctiveness	Condition	SS	Hedgerow Units
Native hedgerow	0.118	Low	Good	High	0.81
Species-rich native hedgerow with trees	0.224	High	Poor	High	1.55
Native hedgerow	0.23	Low	Good	High	1.59
Total	0.572				3.95

Table 14. Baseline Watercourse Habitats

Habitat type	Length (km)	Distinctiveness	Condition	SS	Watercourse Units
Ditches	0.22	Medium	Moderate	High	2.02
Ditches	0.33	Medium	Poor	High	1.52
Ditches	0.092	Medium	Poor	High	0.42
Total	0.642				3.97

6.2 Post-Development Habitats

6.2.1 At Shorne Reedbed, it is proposed that:

- areas of Moderate condition 'Wetland – Reedbeds' will be enhanced to Good condition
- areas of 'Heathland and shrub – Mixed scrub' are lost to areas of 'Grassland – Other neutral grassland' in Poor condition
- 'Wetland – Reedbeds' with areas of Good, Moderate and Poor condition be determined by the feasibility of habitat creation determined by RSPB.
- areas of 'Grassland – Other neutral grassland' present at baseline are lost to create areas of 'Wetland – Reedbeds' at Good, Moderate and Poor condition.

6.2.2 At Cliffe Pools, there is no habitat loss proposed to create an alternative habitat. However, it is proposed that a large area of 'Heathland – Bramble scrub' is enhanced to 'Heathland – Mixed scrub' at Moderate condition. It is also proposed that the 'Ditches' present at Cliffe Pools are enhanced from Poor to Moderate condition to provide the unit requirement for watercourse habitats.

Post-Development Habitats – Strategic Significance (SS)

6.2.3 As outlined in Section 2.1.3, SS has been assigned to all post-development habitats proposed within the Post-Development Plan as follows:

- 'High' SS has been assigned to all naturalised habitats as the Site is present within the Network Enhancement Zone; and
- 'Low' SS has been assigned to non-naturalised habitats due to their lack of ecological value.

Retained Habitats

6.2.4 Habitats that are due to be retained within the Proposed Development are detailed in Table 15 and Table 16. In total, 3.67 ha of area-based habitats and 0.55 km of watercourse habitats are due to be retained with a biodiversity unit value of 34.37 area based units and 3.54 watercourse units respectively.

Table 15. Retained Area-Based Habitats

Broad Habitat	Habitat type	Area (ha)	Distinctiveness	Condition	SS	Habitat Units
Urban	Bare ground	0.35	Low	Poor	High	0.81
Grassland	Modified grassland	1.12	Low	Poor	High	2.58
Wetland	Reedbeds	0.571	High	Moderate	High	7.88
Heathland and shrub	Mixed scrub	0.007	Medium	Poor	High	0.03
Grassland	Other neutral grassland	0.518	Medium	Moderate	High	4.77
Grassland	Other neutral grassland	0.052	Medium	Poor	High	0.24
Lakes	Aquifer fed naturally fluctuating water bodies	0.547	V. High	Good	High	15.10
Wetland	Reedbeds	0.312	High	Poor	High	2.15
Urban	Bare ground	0.032	Low	Poor	High	0.07
Heathland and shrub	Bramble scrub	0.162	Medium	Condition Assessment N/A	High	0.75
Wetland	Reedbeds	0	High	Moderate	High	0.00
Total		3.67				34.37

Table 16. Retained Watercourse Habitats

Habitat type	Length (km)	Distinctiveness	Condition	SS	Watercourse Units
Ditches	0.22	Medium	Moderate	High	2.02
Ditches	0.33	Medium	Poor	High	1.52
Total	0.55	-	-	-	3.54

Offsite Created Habitats

- 6.2.5 Habitats that are due to be created within the Offsite Proposed Development are detailed in Table 17.
- 6.2.6 In total, 1.19 ha of area-based habitats are proposed to be created, this results in a biodiversity unit value of 7.31 habitat units.
- 6.2.7 Habitats to be created include reedbeds and other neutral grassland.

Table 17. Created Area-Based Habitats

Broad Habitat	Habitat type	Area (ha)	Distinctiveness	Target Condition	SS	Delay in starting habitat creation (yrs)	Time to target condition (yrs)**	Habitat Units
Grassland	Other neutral grassland	0.005	Medium	Poor	High	0	2	0.02
Wetland	Reedbeds	0.481	High	Good	High	0	12	4.35
Wetland	Reedbeds	0.708	High	Poor	High	0	3	2.94
Total		1.194	-	-	-		-	7.31

Enhanced Habitats

- 6.2.8 Habitats that are due to be enhanced within the Offsite Proposed Development are detailed in Table 18 and 19.
- 6.2.9 In total, 6.74 ha of area-based habitats are proposed to be enhanced, this results in a biodiversity unit value of 24.77 habitat units. 0.092 km of ditch habitat is also being enhanced, resulting in a unit value of 3.7 units.
- 6.2.10 Habitats to be enhanced include reedbeds and mixed scrub.

Table 18. Enhanced Area-Based Habitats

Habitat type (UKHab) change	Area (ha)	Distinctiveness change	Target Condition change	Strategic Significance	Time to target condition (yrs)	Habitat Units
Heathland and shrub – Bramble scrub → Heathland and shrub – Mixed scrub	3.828	Medium	Moderate	High	5	14.73
Wetland – Reedbeds	2.912	High	Good	High	7	10.04

Habitat type (UKHab) change	Area (ha)	Distinctiveness change	Target Condition change	Strategic Significance	Time to target condition (yrs)	Habitat Units
Total	6.74					24.77

Table 19. Enhanced Watercourse Habitats

Habitat type (UKHab) change	Length (km)	Distinctiveness change	Target Condition change	Strategic Significance	Time to target condition (yrs)	Watercourse Units
Ditches	0.092	Medium	Poor → Moderate	High	4	0.37
Total	0.092					0.37

6.3 Summary of Results

- 6.3.1 All baseline habitats and habitats created, enhanced and retained are present within the accompanying Biodiversity Metric 4.0¹ assessment for the Proposed Development (Appendix I below).
- 6.3.2 A summary of the results is shown in Table 20. Based on the current Post-Development Plan and the Offsite enhancements, the Proposed Development is predicted to result in a net gain of +9.97 habitat units (+11.88%), a net gain of 1.60 hedgerow units (N/A%) and a net gain in watercourse 0.37 units (+23.19%). Hedgerow habitats do have a net gain in regard to units, however, a percentage increase cannot be calculated due to their being no hedgerow units at baseline.

Table 20. Summary of Results

Habitat Type	Total Net Unit Change	Total Net % Change
Area-Based Units	9.97	+11.88%
Hedgerow Units	1.60	N/A
Watercourse Units	0.37	+23.19%

Trading Rules

- 6.3.3 The trading rules within the Biodiversity Metric 4.0¹ are a set of rules that try to prevent the ‘trading down’ of habitat distinctiveness. Under the trading rules losses of habitat are to be compensated for on a “like for like” or “like for better” basis.
- 6.3.4 The trading rules for all habitat distinctiveness categories are satisfied.

7. Conclusion

- 7.1.1 Based on the current plans for the Site, combined with the offsite provisions proposed by the RSPB at Shorne Reedbed and Cliffe Pools, the Proposed Development is predicted to result in a net gain of +11.88% for area-based habitat units, a net gain of 1.60 hedgerow units (no % applicable) and a net gain of 0.37 for river units (23.19%).
- 7.1.2 The outputs of the Biodiversity Metric 4.0¹ are dependent on all retained and enhanced habitats meeting the target conditions, subject to the criteria outlined within Biodiversity Metric 4.0 guidance documents². All created or enhanced habitats (both on and off-site) will be subject to a 30-year management plan. In addition, habitats will need to be monitored to ensure correct establishment and growth, and remedial action would need to be taken if this does not proceed as expected, otherwise the target conditions used in the calculations may not be met and the predicted biodiversity units might not be achieved. The management and monitoring of these created or enhanced habitats will be detailed in the finalised Landscape and Environmental Management Plan (LEMP).
- 7.1.3 National Grid's internal policy is to achieve a minimum 10% net gain (aligning with national policy), on all of their sites and considers that, through this developing strategy, and building on the early engagement that has taken place, it will be possible to deliver this.

Appendix A Baseline Habitat Plan



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LEGEND

- Red Line Boundary
- Boundary of Offsite Enhancement Parcel
- Urban – Rural tree
- Other rivers and streams
- Native hedgerow
- species rich hedgerow with trees
- Ditch
- Riparian Zone
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Bramble scrub
- Heathland and shrub - Mixed scrub
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Artificial unvegetated, unsealed surface
- Urban - Developed land; sealed surface
- Wetland - Reedbeds

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- Urban – Rural tree
- Grassland - Modified grassland
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- Heathland and shrub - Mixed scrub
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Developed land; sealed surface
- Wetland - Reedbeds
- Heathland and shrub - Mixed scrub
- Grassland - Other neutral grassland
- Other standing water
- Wetland - Reedbeds

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LEGEND

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LEGEND

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- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Mixed scrub
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Developed land; sealed surface
- Wetland - Reedbeds

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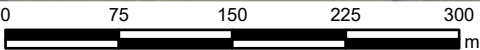
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Figure 1

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LEGEND

- Red Line Boundary
- Boundary of Offsite Enhancement Parcel
- Native hedgerow
- Ditch
- Grassland - Modified grassland
- Urban - Developed land; sealed surface
- Heathland and shrub - Mixed scrub
- Grassland - Other neutral grassland
- Other standing water
- Wetland - Reedbeds

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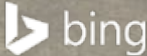
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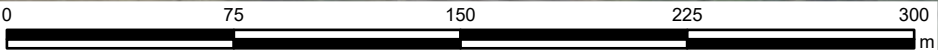
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- LEGEND**
- Boundary of Offsite Enhancement Parcel
 - Other rivers and streams
 - Native hedgerow
 - species rich hedgerow with trees
 - Riparian Zone
 - Grassland - Modified grassland
 - Heathland and shrub - Bramble scrub
 - Wetland - Reedbeds
 - bare ground

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Appendix B Post Development Plan



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- Boundary of Offsite Enhancement Parcel
- Urban – Rural tree
- Other rivers and streams
- Native hedgerow
- species rich hedgerow with trees
- Ditch
- Urban - Rural Trees
- Riparian Zone
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Grassland – Floodplain wetland mosaic and CFGM
- Other standing water
- Heathland and shrub - Bramble scrub
- Heathland and shrub - Mixed scrub
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Artificial unvegetated, unsealed surface
- Urban - Developed land; sealed surface
- Wetland - Reedbeds
- Urban – Other green roof
- Urban - Sustainable drainage feature

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Figure 2

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CONSULTANT

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Cathedral Approach
Manchester, M3 7FB
www.aecom.com

LEGEND

- Red Line Boundary
- Urban - Rural Trees
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Bramble scrub
- Heathland and shrub - Mixed scrub
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Artificial unvegetated, unsealed surface
- Urban - Developed land; sealed surface
- Wetland - Reedbeds
- Urban - Other green roof

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LEGEND

- Red Line Boundary
- Boundary of Offsite Enhancement Parcel
- Urban – Rural tree
- Ditch
- Urban - Rural Trees
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Bramble scrub
- Heathland and shrub - Mixed scrub
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Artificial unvegetated, unsealed surface
- Urban - Developed land; sealed surface
- Wetland - Reedbeds
- Urban – Other green roof
- Urban - Sustainable drainage feature

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LEGEND

-  Red Line Boundary
-  Urban - Rural Trees
-  Urban - Developed land; sealed surface

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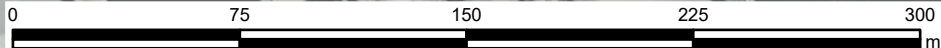
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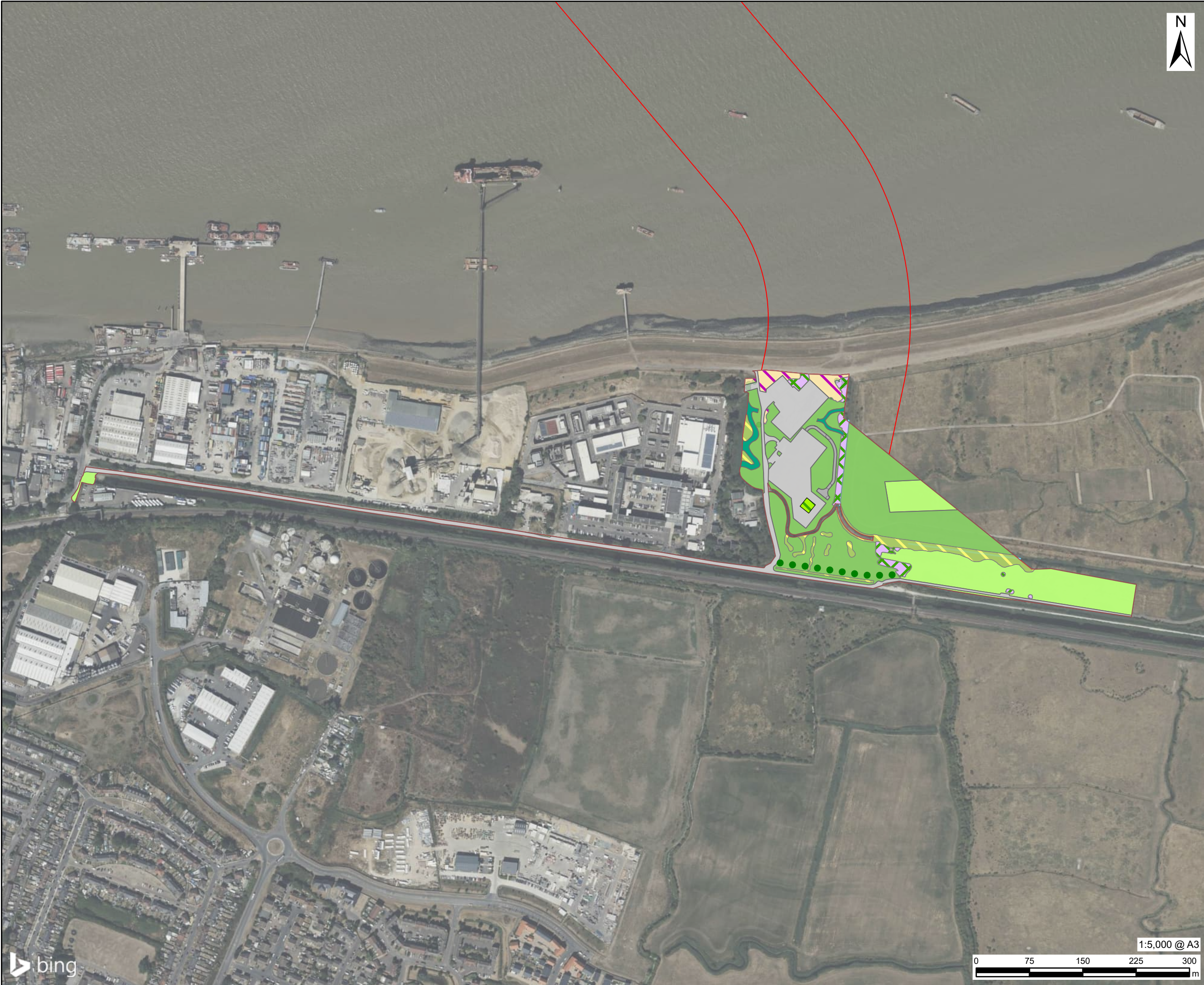
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LEGEND

- Red Line Boundary
- Urban – Rural tree
- Urban - Rural Trees
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Mixed scrub
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Artificial unvegetated, unsealed surface
- Urban - Developed land; sealed surface
- Wetland - Reedbeds
- Urban – Other green roof
- Urban - Sustainable drainage feature

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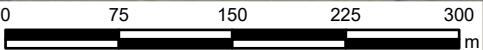
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LEGEND

- Red Line Boundary
- Boundary of Offsite Enhancement Parcel
- Native hedgerow
- Ditch
- Urban - Rural Trees
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Other standing water
- Heathland and shrub - Mixed scrub
- Urban - Developed land; sealed surface
- Wetland - Reedbeds

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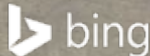
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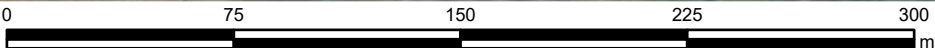
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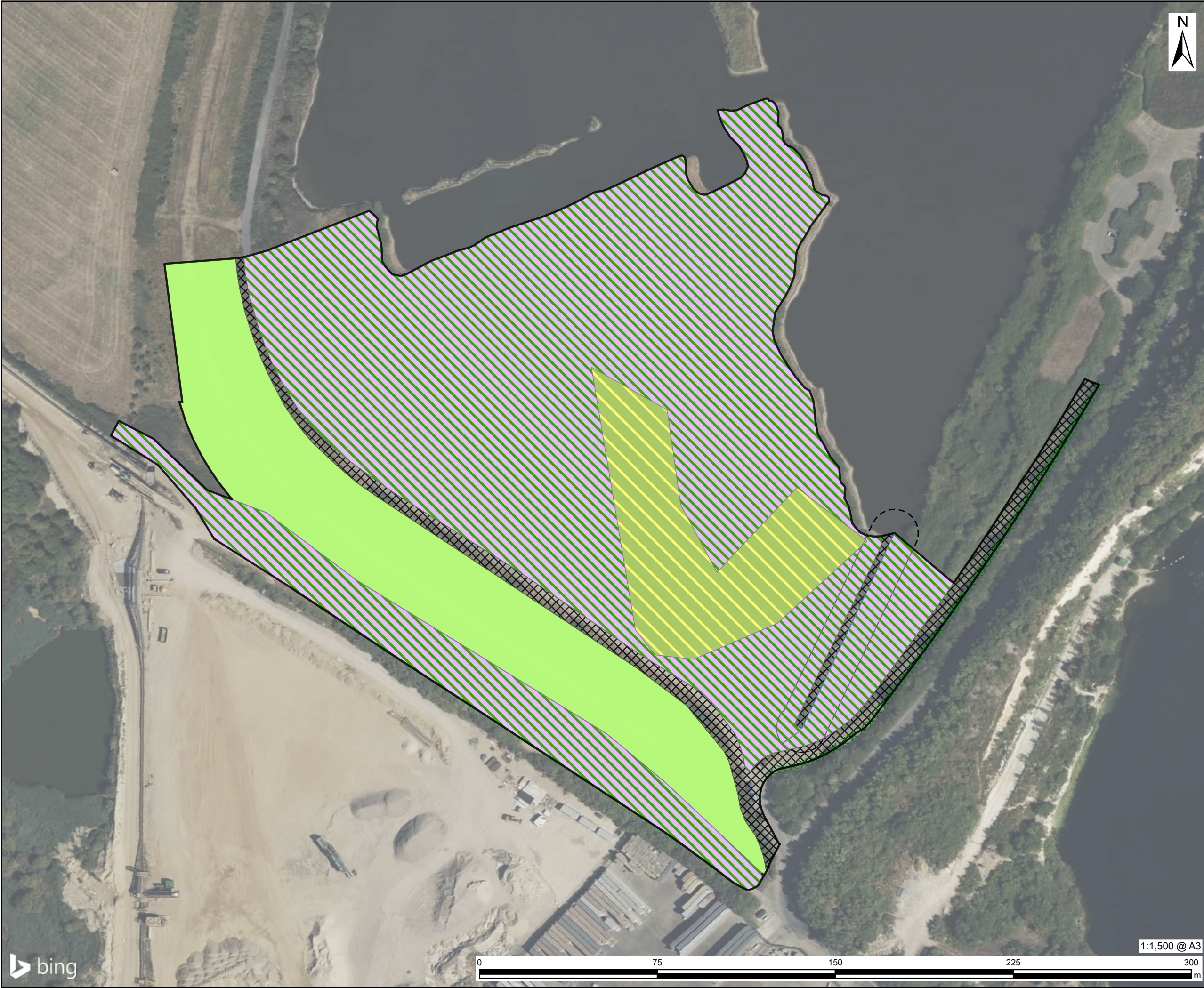
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LEGEND

- Boundary of Offsite Enhancement Parcel
- Other rivers and streams
- Native hedgerow
- species rich hedgerow with trees
- Urban - Rural Trees
- Riparian Zone
- Grassland - Modified grassland
- Heathland and shrub - Bramble scrub
- Wetland - Reedbeds

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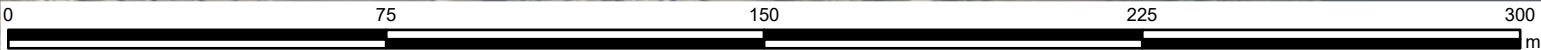
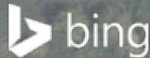
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Appendix C Habitat Classification Conversions

C.1 UKHab to BNG Conversion

UKhab Classification	UKHab Classification
Modified grassland	Grassland - Modified grassland
<i>Arrhenatherum</i> neutral grassland	Grassland - Other neutral grassland
<i>Lolium-Cynosorus</i> neutral grassland	Grassland - Other neutral grassland
<i>Arrhenatherum</i> neutral grassland	Grassland - Other neutral grassland
Bramble scrub	Heathland and shrub - Bramble scrub
Mixed scrub	Heathland and shrub - Mixed scrub
Ruderal/Ephemeral	Sparsely vegetated land - Ruderal/Ephemeral
Hardstanding (Gravel)	Urban - Artificial unvegetated, unsealed surface
Hardstanding	Urban - Developed land; sealed surface
Reedbeds	Wetlands - Reedbeds

C.2 Outline Landscape and Ecological Management Plans to UKHab Conversion

Landscape Plan Classification	UKHab Classification
Proposed buildings and infrastructure footprint	Urban - Developed land; sealed surface
Site access road	Urban - Developed land; sealed surface
Grassland strips to be created to match surround grassland	Grassland –Other neutral grassland
Existing drainage ditch	Ditches
Individual specimen tree	Individual trees – Rural tree
Proposed scrub	Heathland and shrub - Mixed scrub
Biodiverse roof	Urban – Other green roof
External gravel access track	Urban - Artificial unvegetated, unsealed surface

Landscape Plan Classification	UKHab Classification
Existing infrastructure footprint	Urban - Developed land; sealed surface
Proposed drainage ditches	Urban - Sustainable drainage system

Appendix D Condition Assessment Rationale

All condition assessment data were collected during the condition assessment survey undertaken by AECOM in March 2023 using Biodiversity Metric 3.1 condition criteria² and assessor professional judgement.

Habitat type	Habitat reference	Habitat condition sheet	Condition criteria passed	Condition
Grassland - Modified grassland	G1	5 Grassland Low	Passed C, D, F and G	Poor
Grassland - Modified grassland	G2	5 Grassland Low	Passed C, D, E, F and G	Poor
Grassland - Modified grassland	G6	5 Grassland Low	Passed A, D, E, F and G	Moderate
Grassland - Modified grassland	G7	5 Grassland Low	Passed A, D, E, F and G	Moderate
Grassland - Other neutral grassland	G3	6 Grassland Med, High and V. High	Passed A, B, C, D, and E	Moderate
Grassland - Other neutral grassland	G4	6 Grassland Med, High and V. High	Passed A, B, C, D, and E	Moderate
Grassland - Other neutral grassland	G5	6 Grassland Med, High and V. High	Passed A, C, D	Moderate
Ditches	D1	4 Ditch	Passed D, E, F, G, and H	Poor
Heathland and shrub - Bramble scrub	S1	N/A - Pre-set condition	N/A - Pre-set condition	Condition Assessment N/A
Heathland and shrub - Mixed scrub	S2	20 Scrub	Passed A, C, D	Moderate
Heathland and shrub - Mixed scrub	S3	20 Scrub	Passed A, C, D	Moderate
Heathland and shrub - Mixed scrub	S4	20 Scrub	Passed A, B, C, D	Moderate
Heathland and shrub - Mixed scrub	S5	20 Scrub	Passed A, C, D	Moderate
Sparsely vegetated land - Ruderal/Ephemeral	R1	22 Urban	Passed C	Poor
Sparsely vegetated land - Ruderal/Ephemeral	R2	22 Urban	Passed B and C	Moderate
Wetlands - Reedbeds	W1	23 Wetland	Passed B, C, D, E, and F	Moderate
Wetlands - Reedbeds	W3	23 Wetland	Passed B, C, E and F	Moderate
Urban - Artificial unvegetated, unsealed surface		N/A - Pre-set condition	N/A - Pre-set condition	N/A - Other
Urban - Developed land; sealed surface		N/A - Pre-set condition	N/A - Pre-set condition	N/A - Other

Appendix E Strategic Significance Rationale

Source	Strategic Significance Information
Multi-Agency Geographic Information for the Countryside (MAGIC)	The Sites are present within the Network Enhancement Zones of the National Habitat Network <u>Application to assessment</u> All naturalised habitats within the Network Enhancement Zones are assigned High SS
- Gravesham Local Plan Core Strategy (2014) - Local Plan Policies Map	Policy CS12: Green Infrastructure states “Sites designated for their biodiversity value will be protected” additionally, states “There will be no net loss of biodiversity in the Borough, and opportunities to enhance, restore, re-create and maintain habitats will be sought, in particular within the Biodiversity Opportunity Areas shown on the Strategic Green Infrastructure Network map and within new development. The Site area situated within the Gravesham Borough Council boundary is within a Local Wildlife Site (LWS) and the North Kent Marshes Biodiversity Opportunity Area. <u>Application to assessment</u> All naturalised habitats within this area are assigned High SS
Thurrock Council Core Strategy and Policies for Management of Development (as amended) Adopted January 2015	Policy CSSP 5 – Sustainable Greengrid put emphasis on protecting and creating grasslands, reedbeds, hedgerow, and Woodlands. Policy CSTP19 – Biodiversity and Policy PMD7 – Biodiversity, Geological Conservation and Environment refers to the Thurrock Biodiversity Action Plan 2007-2012 which identifies Ancient or Species Rich Hedgerows, Ancient Woodland, Calcareous Grassland, Coastal Grazing Marsh, Brownfield Wildlife Land, Lowland Heathland, Reedbeds, Roadside Verges, Thames Terrace Grassland and Urban Habitats <u>Application to assessment</u> All habitats within the Proposed Development which fall under the Thurrock Biodiversity Action Plan 2007-2012 are assigned Medium SS
Thurrock Council Core Strategy Policies Map	Part of the Post Development is situated within a LWS <u>Application to assessment</u> All naturalised habitats within the LWS are assigned High SS

Appendix F BNG Good Practice Principles for Development

Principle	How has this been applied in the assessment
Principle 1: Apply the Mitigation Hierarchy	The mitigation hierarchy has been applied during this assessment by means of engaging with all disciplines, in particular the landscape architects, for the project and finding the best ecological solutions for the Site. The trading rule for High distinctiveness habitats ('Wetland – Reedbeds') has been satisfied
Principle 2: Avoid losing biodiversity that cannot be offset by gains elsewhere	One veteran tree was present on Site, this has been retained as is classified as irreplaceable. All habitats lost are of medium distinctiveness or lower and are therefore deemed as being suitable for off-site offsetting.
Principle 3: Be inclusive and equitable	RSPB have been consulted during this assessment to investigate potential off setting areas and agree on two areas to take forward.
Principle 4: Address risks	Habitats of most value have been offset or impacts avoided where possible. Development has sought to impact habitats for as short a period as possible (particularly underneath new overhead lines), where prolonged impacts are expected, habitat creation delays have been applied. Provision of compensatory habitats are explored in the Draft Strategy document.
Principle 5: Make a measurable Net Gain contribution	The outputs of this assessment achieve a +10% net gain whilst also achieving RSPB aspirations.
Principle 6: Achieve the best outcomes for biodiversity	The habitats proposed at post-development have been designed to link into the surrounding habitats whilst replacing like for like where possible to ensure the biodiversity of the area is not negatively impacted. The enhancements proposed at the off-site areas have benefits for wildlife.
Principle 7: Be additional	The offsetting provides +10% BNG whilst also having advantageous outcomes for RSPB through the funding of desired wildlife habitat creation and/or enhancement.
Principle 8: Create a net gain legacy	The offsetting is in collaboration with RSPB and will create habitats of local importance.
Principle 9: Optimise sustainability	BNG has been prioritised throughout the Site by reducing impacts where possible. Screening has been provided to the South of Gravesend to limit views from the public footpath.

Principle 10: Be transparent

Particular effort has been made to adopt a precautionary and transparent approach when assessing the impacts of the development upon the habitats currently present. All BNG activities have been communicated transparently in this BNG report and associated Statutory Biodiversity calculator with creation delays and temporary impacts being recorded to the best of knowledge at the time of assessment.

Appendix G Habitat Management Required to Achieve Target Condition

Habitat type	Target condition and condition criteria	Associated habitat management requirements	Condition score
Grassland – Other neutral grassland	Target condition is 'Moderate' in 5 years. The condition criteria are as follows. Passes 3 of 6 criteria. - The grassland is a good representation of the habitat type it has identified as based on its UKHab description. Pass. - Sward height is varied, 20% over 7cm in height and 20% less than 7cm in height. Pass. - Cover of bare ground is between 1 and 5 percent. Fail. - Cover of Bracken is less than 20% and bramble less than 5%. Fail. - There is an absence of invasive non-native species and species indicative of sub-optimal condition. Pass. - There are more than 10 plant species per metre squared. Fail.	<u>To achieve the target condition, habitat creation should follow prescriptions set out in detailed planting plans but will comprise of the following:</u> <u>Year 1:</u> September to October – Seed with seeds collected from adjacent habitats and sow thinly with 2g/m2. Include tall fescue tussocks to be translocated from removal prior to construction.. <u>Year 2:</u> April to June/July – control annual weeds by pulling or pot treatment July to September – Mow to 5-10cm <u>Year 3 onwards</u> Cut and collect arisings late July early August Grassland condition should be monitored as a minimum in years 2, 5, 8, 10, 20 and 30. Management intervention options following monitoring should include alteration of mowing regimes and additional over seeding (including the use of additional yellow rattle where considered necessary).	Moderate
Heathland and shrub – Mixed scrub	Target condition is 'Moderate' in 5 years. The condition criteria are as follows. Passes 4 of 5 criteria. - The scrub is a good representation of the habitat type it has been identified as, based on it's UKHab description. At least 80% of scrub and there are at least three woody species with no one species comprising more than 75% of the cover. Pass. - Seedlings, saplings, young shrubs and native shrubs are all present. Pass.	<u>To achieve the target condition, habitat creation should follow prescriptions set out in detailed planting plans but will comprise of the following:</u> <u>Year 1:</u> Use low fertility topsoil September to October sow with tussock seed mix (Emorsgate EG26, EM10, EM10F or similar to align with surrounding habitat and previous species mix) Plant ¼ area with hawthorn. Blackthorn, gorse and bramble Protect with biodegradable guards where appropriate. <u>Year 3</u>	

Habitat type	Target condition and condition criteria	Associated habitat management requirements	Condition score
	- There is an absence of invasive non-native plant species and species indicative of sub-optimal condition make up <5% of ground cover. Pass - Scrub has a well-defined edge with scattered scrub and tall grassland or forbs present. Pass. - Clearings, glades and rides are present within the scrub. Fail.	Plant ¼ area with hawthorn. Blackthorn, gorse and bramble Protect with biodegradable guards where appropriate <u>Year 5</u> Plant ¼ area with hawthorn. Blackthorn, gorse and bramble Protect with biodegradable guards where appropriate Manage invasive non-native species <u>Years 6-10</u> Restructure scrub planting to create a mosaic of mixed age scrub stands and open tussock grassland aiming to achieve a mosaic/matrix of 75% scrub. Manage on a rotational cut removing 30% of closed canopy scrub every 2 years - with the aim to develop a spectrum of successional scrub communities by maintaining patches of mixed scrub at different stages of growth from freshly cut to closed canopy.	
Sparsely vegetated land – Ruderal/Ephemeral	Target condition is 'Moderate' in 3 years. The condition criteria are as follows. Passes 2 of 3 criteria. - Vegetation structure is varied, providing opportunities for vertebrates and invertebrates to live, eat and breed. No vegetation type accounts for >80% of total area. Fail. - Habitat parcel contains different plant species that are beneficial for wildlife. Pass. - Invasive non-native plant species and others which are detrimental to native wildlife account for <5% of vegetated area. Pass.	<u>To achieve the target condition, habitat creation should follow prescriptions set out in detailed planting plans but will comprise of the following:</u> <u>Year 1</u> Use low fertility topsoil and ballast for any landscaping September to October sow with seed mix similar to that present at baseline to create species and nectar rich ephemeral habitat: <u>Year 2 – 5</u> Allow for natural colonisation and self-seeding, strimming and removing arisings if necessary, in autumn of year 3. Spot treat/remove invasive non-native and negative indicators species yearly.	
Urban – Sustainable urban drainage feature	Target condition is 'Moderate' in 3 years. The condition criteria are as follows. Passes 4 of 5 criteria. - Vegetation structure is varies, providing opportunities for vertebrates and invertebrates to live, eat and breed. Single vegetation type does not account for more than 80% of total habitat area. Fail. - The habitat parcel contains different plant species beneficial for wildlife. Pass.	<u>To achieve the target condition, habitat creation should follow prescriptions set out in detailed planting plans but will comprise of the following:</u> <u>Year 1</u> Clear any vegetation along length of the ditch <u>Dig to be twice as wide as is deep with gently sloping sides</u> <u>Fill the bottom of the ditch with large, crushed rock</u>	Moderate

Habitat type	Target condition and condition criteria	Associated habitat management requirements	Condition score
	- Invasive non-native plant species and others that are detrimental to native wildlife cover <5% of total vegetated area. Pass. - Plant species are mostly native. If non-natives are present, they should not be detrimental to wildlife. Pass. - Vegetation is comprised of plant species suited to wetland or riparian situations. Pass.	<u>Lay suitable membrane over rock, cover with more gravel and then 2.5 cm topsoil before planting suitable seeds</u> <u>Year 2 onwards</u> <u>Ensure shading is kept to a minimum</u> <u>Maintain gradual sloping sides</u> <u>Avoid over-deepening</u> <u>Ensure water quality is maintained</u>	
Wetland – Reedbeds	Target condition is 'Moderate' in 7 years. The condition criteria are as follows. Passes 4 of 7 criteria. - The water table is at or near the surface throughout the year. Fail. - The parcel is a good representation of the wetland habitat type is has been identified as, based on its UKHab description. Pass. - The water supplies to the wetland are of good water quality with clear water. Pass. - Cover of scrub and scattered trees is <10%. Fail. - Cover of bare ground is <5%. Pass. - There is an absence of invasive non-native plant species and species indicative of sub-optimal condition make up <5% of ground cover. Pass. - Reedbed has a diverse structure with between 60 and 80% reed <i>Phragmites australis</i>. Fail.	<u>To achieve the target condition, habitat creation should follow prescriptions set out in detailed planting plans as reedbed creation is Site specific, but will likely comprise the following:</u> <u>Year 1</u> Conservation dredge area to create open water mosaic: 25-30% open pools, 40-50% wet reed area, 15-25% dryer reed area and 5% scrub Install/stake coir matting with common reed <i>Phragmites communis</i>. <u>Years 2-7</u> Monitor establishment replanting where necessary.	Moderate
Individual trees– Rural tree	Target condition is 'Moderate' in 27 years. The condition criteria are as follows. Passes 3 of 6 criteria The condition criteria for these urban trees are as follows: - More than 70% of trees are native species. Fail. - Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide. Pass. - More than 50% of trees are mature or veteran. Fail.	<u>To achieve the target condition, habitat creation should follow prescriptions set out in detailed planting plans but will comprise of the following:</u> - All plants to be staked using 3 stake system - Watering - In periods of dry weather apply sufficient water to maintain healthy growth. - Refirming - Ensure that all trees are firmly bedded in the ground after strong winds, frost heave or other disturbances. - Ensure stakes are checked periodically and removed when trees have reached a stable growth.	Moderate

Habitat type	Target condition and condition criteria	Associated habitat management requirements	Condition score
	- There is little or no evidence of an adverse impact on tree health by anthropogenic activities such as vandalism or herbicide use. There is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height. Pass. - Management regime has encouraged micro habitat sites for birds, mammals and insects e.g. presence of deadwood, cavities or loose bark etc. Fail. - Trees are immediately adjacent to other vegetation, and tree canopies are oversailing vegetation beneath. Pass.	Take remedial action if plants become damaged and replace if there is any failure.	
Line of Trees	Target condition is 'Moderate' in 20 years. The condition criteria are as follows. Passes 3 of 5 criteria. - At least 70% of trees are native species. Pass. - Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide. Pass. - One or more trees has veteran features and or natural ecological niches for vertebrates and invertebrates, such as presence of standing and attached deadwood, cavities, ivy or loose bark. Fail. - There is an undisturbed naturally-vegetated strip of at least 6 m on both sides to protect the line of trees from farming and other human activities (excluding grazing). Where veteran trees are present, root protection areas should follow standing advice. Fail. - At least 95% of the trees are in a healthy condition (deadwood or veteran features valuable for wildlife are excluded from this). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity. Pass.	As above.	Moderate

Appendix H Baseline Habitat Descriptions

Site	Habitat type (UKHab)	Habitat description
Tilbury Site	Scrub	Three blocks of scrub; one within the western grassland, one in the southwest corner of Site, and one running along the western and southern slopes of the plateau, were recorded on Site.
	Semi-improved Grassland	Three blocks of semi-improved grassland; one running along the west of the Site, one running along the southern section of Site, and one located on the northern edge of the plateau, were recorded on Site.
	Hardstanding	Hard standing area consisting of a former car park and the haul road runs from east to west across the centre of the Site.
	Ephemeral/short perennial	Small patches of ephemeral and short perennial vegetation growing through areas of previously bare ground
	Rural trees	Three medium sized rural trees present within the Site.
Gravesend	Semi-Improved Grassland	The majority of the site consists of semi-improved grassland that is managed infrequently
	Amenity Grassland	A strip of improved grassland managed frequently to keep the sward height short year-round for shooting.
	Scattered scrub	Scattered scrub is present in the north-east corner of the site with small clusters of shrubs throughout the semi-improved grassland.
	Hard Standing	Hard standing area consists of paths running across the south and centre of the Site.
	Marshy Grassland	A damp strip of grassland is present to the north of the block of amenity grassland.
	Buildings	A substation is already present in the south-south west of the Site
	Running water	Ditch with flowing water running along the southern edge of the site.
	Rural trees	One small tree and one veteran tree present within the Site.

Appendix I Biodiversity Metric 4.0 Calculation

