Gilston Park Estate

North of Harlow

10 - Appropriate Assessment note

places for people

May 2014

GILSTON PARK ESTATE

Identification of Potential Impacts on European Sites

Introduction

1.1 The Gilston Park Estate (GPE) site (the Site) (See **Map** 1) is being promoted by Places for People (PfP) through the local plan process as a location for residential development and supporting infrastructure. The purpose of this note is to provide information on the implications of development of the GPE site on European Protected sites within the potential zone of influence of the proposals, in relation to the protection afforded to such sites under the European Directive 92/43/EEC "*on the conservation of Natural Habitats and of wild fauna and flora*" known as the "*Habitats Directive*".

1.2 The Habitats Regulation Assessment (HRA) screening report of the East Hertfordshire District Plan Scenarios (URS 2012) identified that the implications of air pollution as a result of development North of Harlow on the sensitive features of Lee Valley Special Protection Area (SPA) Ramsar and Epping Forest Special Area of Conservation (SAC) required further investigation. It went on to report that a further more detailed HRA would be required as the District Plan developed.

1.3 Ecological Planning & Research (Ltd) have consulted with Natural England, on behalf of PfP, regarding the implication of development on International sites and Natural England has advised, that development North of Harlow could potentially have a significant effect the Lee Valley SPA Ramsar as a result of increased recreational use and Epping Forest SAC from impacts from recreation and air pollution. Although **Map 1** shows Wormley-Hoddesdon Park Woods SAC is within 10 km of the GPE site Natural England does not consider that development at GPE will have a significant effect on the features for which the site has been designated, therefore it is not considered in this note and would not be included in any subsequent HRA.

Key Relevant Legislation

1.4 As noted above, the primary legislative mechanism detailing the protection afforded to International Sites of relevance to this note originates from the Habitats Directive. Articles 6(3) and 6(4) of the Habitats Directive are relevant to the development proposals in view of their potential to exert effects upon International Sites:

"3. Any plan or project not directly connected with or necessary to the management of the [European] *site but likely to have a significant effect thereon, either* ***alone or in combination with other plans or projects****, shall be subject to* ***appropriate assessment*** *of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4,* ***the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned*** *and, if appropriate, after having obtained the opinion of the general public.*

4. If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest." **[EPR emphasis].**

1.5 The Habitats Directive thus requires that a sequential approach be adopted when addressing potential impacts upon International Sites. Guidance for doing this in practice has been published by the European Commission and others.

1.6 The relevant sections of the Habitats Directive set out above are transposed into UK law by the **Conservation of Habitats and Species Regulations 2010**. In particular, the prescriptions relating to "Appropriate Assessment" and the protection of International Sites in relation to the effects of development projects are transposed by Regulations 61 to 67.

European Designated Sites Features to be Considered

Epping Forest SAC

1.7 The qualifying features for Epping Forest SAC are:

Habitats Directive Annex I habitats;

- Beech forests on acid soils: as an example of such habitat toward the north-east of its UK range, containing a notable selection of bryophytes, fungi and dead-wood invertebrates;
- Wet heathland with cross-leaved heath; and
- Dry heath

1.8 Habitats Directive Annex II species:

- Stag Beetle *Lucanus cervus.*

Lee Valley SPA and Ramsar

1.9 The Lee Valley is designated as a SPA and Ramsar for the following Birds Directive Annex I species that over winter:

- Bittern *Botaurus sellaris* (6% of the wintering population of Great Britain);
- Gadwall *Anus strepers (2.6% of the wintering population of Great Britain); and*

- Sho*veler Anas clypeta* (1.9% of the wintering population of Great Britain).

1.10 In addition the sites qualifies as a Ramsar under criterion 2 (UN, 2005) by supporting the nationally scarce plant species Whorled Water-milfoil *Mytiophyllum verticillatum* and the rare of vulnerable invertebrate *Micronecta minuiissima* a Water-boatman).

Assessment of Potential Impacts on Features of European Designated Sites in the Absence of Mitigation

Introduction

1.11 The two potential impacts on European sites have been identified as coming from air pollution, particularly increases in the deposition of nitrogen due to an increase in traffic, and impacts caused from an increase in recreational pressures. The potential likely impacts of each are discussed below.

Air Pollution

1.12 AECOM, on behalf of PfP, have undertaken an assessment of potential air quality impacts associated with potential development at GPE. (See **Appendix 1** to this note). The assessment is based on criteria set out in the Design Manual for Roads and Bridges (DMRB) for identifying roads, which are likely to be significantly affected by changes in traffic movements, and uses traffic data modelled to take into account the potential maximum number of new dwellings that could be provided. The results of the assessment identified that there were significant increase in traffic, which potentially could result in significant effects from air pollution being experienced within in the Lee Valley SPA Ramsar, but that the proposed development would not result in any significant changes to traffic in the vicinity of Epping Forest SAC. Therefore only potential impacts on the Lee Valley are considered further.

1.13 The road traffic modelling identified that movement along the A414, west of the GPE site, could result in potentially significant effects on the Lee Valley SPA. Considering the features for which the site is designated and with reference to the Air Pollution Information System (APIS) website, which provides information on critical loads and deposition data for nitrogen for designated features, Bittern is sensitive to increase in nitrogen on the broad habitats on which it depends. APIS identifies this broad habitat type as 'Rich Fens' for which the critical load and total nitrogen deposition are 15-30 kg N/ha/yr and 18.34 kg N/ha/yr respectively. Following the recommendation of the APIS website and as a precautionary approach 15 kg N/HA/yr is used as the critical load for the assessment.

1.14 The results of the assessment, while identifying that there will be some increase in nitrogen deposition, concludes that it will not be significant within the Lee Valley SPA Ramsar site as it will contribute less than 1% of the critical load.

Recreation

1.15 Both Lee Valley SPA and Epping Forest SAC are identified, as being vulnerable to habitat loss and damage through recreation and Lee Valley Ramsar has also been identified as being vulnerable to the effects of disturbance through recreation. Recreational pressure on Epping Forest SAC is likely to increase as the population increases in east Hertfordshire, Epping Forest and north east London, including increase associated with development of the GPE site. The Epping Forest Management Plan recognises the importance of Epping Forest as an

resource for public recreation and enjoyment, but also acknowledges that this must be balanced with the protecting the Forest environment and biodiversity and access must therefore be managed accordingly. Currently the City of London Corporation funds access management, but his will come under increasing pressure as visitor number rise.

1.16 The Lee Valley SPA Ramsar is part of the Lee Valley Regional Park, which provides a variety of recreational resources including sports centers, urban green spaces, country parks and nature reserves. Recreational pressure is currently managed through zoning of water bodies within the Park. The two parts of the SPA closest to GPE site are Amwell Quarry and Ryemeads, both of which are nature reserves managed by Herts & Middlesex Wildlife Trust and RSPB and Herts & Middlesex Wildlife Trust respectively, which will include the management of visitor access.

Potential Impact Avoidance and Mitigation Measures

1.17 To minmise the potential for recreational impacts as a result of increased visitors to the Lee Valley SPA Ramsar and the Epping Forest SAC from development at GPE it is proposed that the development will include a significant element of informal open space to include a variety of different semi-habitats. As well as providing for residents with in the GPE development these new sites are also likely to attract visitors currently resident in the area.

1.18 The proposal will include a woodland park (Eastwick Wood Park) in the north of the site linking and protecting existing areas of woodland with extensive appropriate woodland and grassland planting. The park will be multi-functional allowing for a variety of recreational uses including dog walking, horse riding and the enjoyment of wildlife with the most intensive recreational uses being located away from ecologically sensitive areas.

1.19 Areas in the south of the Site within the Stort Valley will also be enhanced and new wetland habitat created to contribute to the establishment of a Riverside Park. The Park will be traditionally managed and be integrated with recreational uses, linking to current recreational uses in the Stort Valley.

1.20 The Parks in the north and south of the Site will be linked through linear park providing open space along the valleys of tributary stream of the River Stort creating a network of open space accessible from throughout the development.

1.21 It is intended that the provision of Eastwick Wood Park, the River Valley Park and the linear parks will provide an attractive and convenient alternative to people visiting Lee Valley SPA Ramsar and Epping Forest SAC on a regular basis.

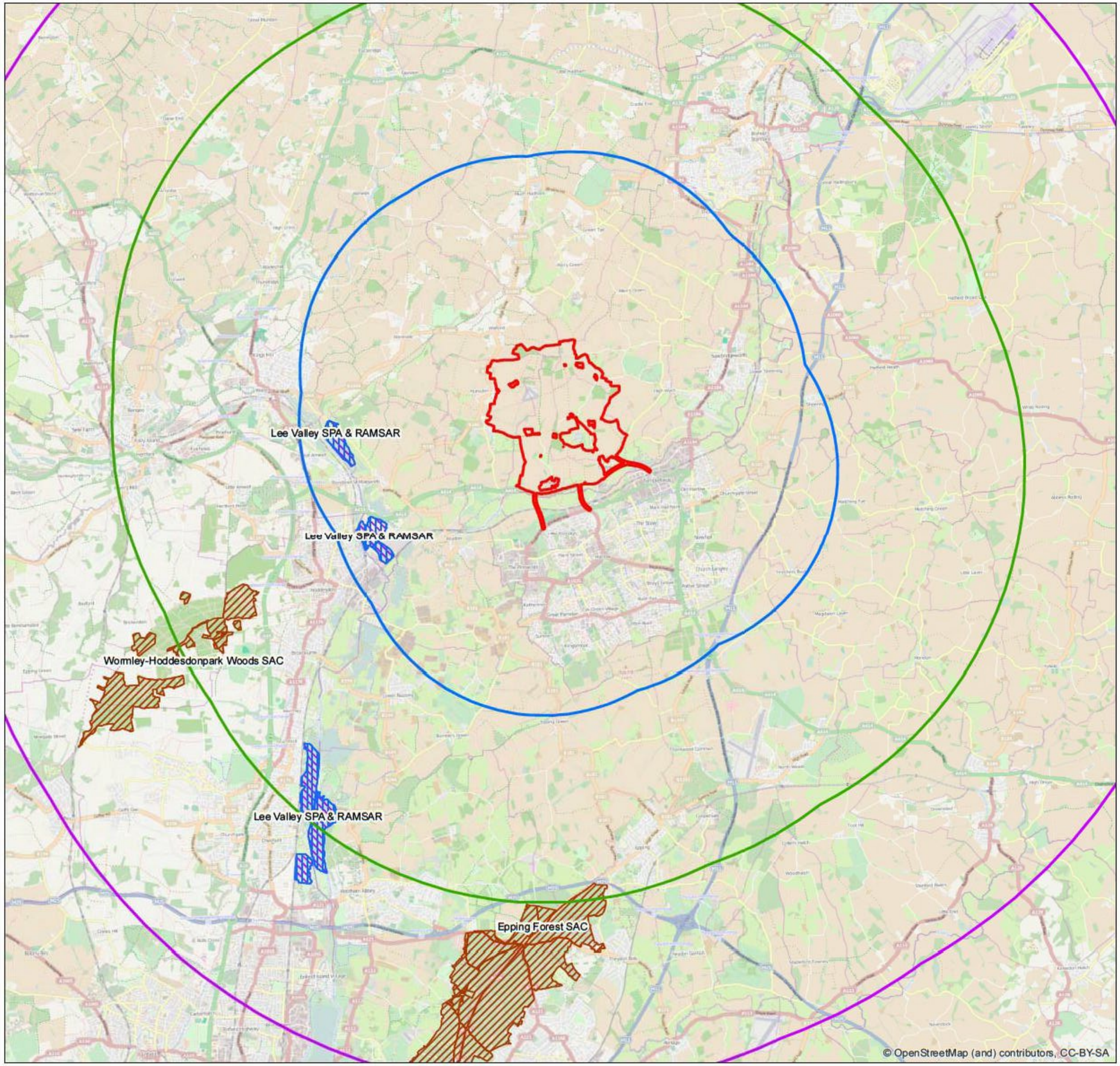
Conclusions

1.22 The air quality assessment has identified that any increase in air pollution associated with an increase in traffic from the GPE development will not lead to any significant impacts on the features for which Lee Valley SPA Ramsar and Epping Forest SAC have been designated.

1.23 Significant impacts on the features, as a result of increases in recreational pressure are not likely due to the provision of alternative semi-natural open space which will be provided as

part of the development proposals namely Eastwick Wood Park, the Riverside Park and the linear parks.

1.24 As part of the EIA process evidence will be gathered on the current recreational patterns of residents in the area and from the Lee Valley SPA Ramsar and Epping Forest SAC. This information will be used to inform the detailed design of the new open spaces to ensure that they meet the needs of the new visitors and will provide an attractive alternative to the Lee Valley SPA and Epping Forest SAC. This work will be able to be used to support a Habitats Regulation Assessment of the proposals.



MAP 1 Site Location & European Designated Sites

KEY

- Site boundary
- 5km linear distance to site boundary
- 10km linear distance to site boundary
- 15km linear distance to site boundary
- Special Protection Area (SPA)
- Special Area for Conservation (SAC)
- RAMSAR site

SCALE: 1:100,000 at A3

0 1,000 2,000 3,000 4,000 Metres

N

EPR

Ecological Planning & Research

CLIENT: Places for People

PROJECT: Gilston Park Estate

DATE: May 2014

P12/58

Appendix 1
Gilston Park Estate, Harlow – Air Quality Input to appropriate Assessment

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AECOM Environment Places for People May 2013

Gilston Park Estate, Harlow - Air Quality Input to Appropriate Assessment

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Rev No	Comments	Checked by	Approved by	Date
1	Draft for client comment	SJP	MPH	May 2013

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Capabilities on project:
Environment

1 Introduction

This report summarises the results of an assessment of potential air quality impacts associated with the proposed Gilston Park Estate development on designated ecological sites. The assessment was undertaken to gauge the potential impacts of increased road traffic movements associated with the proposed development on rates of nitrogen deposition to sensitive ecosystems within the Lee Valley Special Protection Area (SPA) / Ramsar site and Epping Forest Special Area of Conservation (SAC).

1.1 Locations of Designated Sites

The locations of the designated ecological sites considered in this assessment are shown in Figure 1 of Appendix A. It can be seen that a section of the Lee Valley SPA / Ramsar site lies adjacent to the A414 approximately 5 km west of the proposed development site and that a section of the Epping Forest SAC lies adjacent to the M25, between Junction 26 and 27, approximately 10 km south of the proposed development site. Road traffic associated with the proposed development travelling along these sections of road therefore has the potential to result in increased nitrogen deposition rates within these sites due to NOx exhaust emissions.

Capabilities on project:
Environment

2 Methodology

2.1 Scope

The Design Manual for Roads and Bridges (DMRB)[1] defines criteria for 'affected' roads, i.e. those roads which are likely to be significantly affected by changes in road traffic movements. According to the DMRB, changes considered likely to result in a significant effect are where:

- road alignment will change by 5 m or more; or
- daily traffic flows will change by 1,000 AADT or more; or
- Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or
- daily average speed will change by 10 km/hr or more; or
- peak hour speed will change by 20 km/hr or more.

Comparison of the above criteria to the traffic data in Appendix B indicates that:

- Potentially significant effects may be experienced within the Lee Valley SPA as Annual Average Daily Traffic (AADT) movements along the A414 West of the proposed development site are estimated to increase by over 1,000 as a result of the proposed development. An assessment of the impact of development traffic on nitrogen deposition rates within the Lee Valley SPA has therefore been undertaken; and
- The proposed development is estimated to lead to changes in traffic volume of less than 1,000 AADT along the M25 adjacent to the Epping Forest SAC. According to the DMRB criteria described above therefore, any resulting impacts are unlikely to be significant. No further assessment has therefore been undertaken of potential impacts of development traffic on this site.

2.2 Baseline Conditions

The Air Pollution information System (APIS) website[2] provides critical loads and deposition data for nitrogen for designated features within every SAC, SPA or Site of Special Scientific Interest (SSSI) in the UK.

With regard to the Lee Valley Special Protection Area (SPA) / Ramsar site, the APIS website indicates that the 'Great Bittern' is sensitive to nitrogen impacts on its broad habitat. This is because the species requires pure reed stand with vigorous growth over the whole area. However it is noted that many sites are currently subject to active habitat management and restoration to enhance their suitability for this species.

The APIS website provides the following information regarding critical loads and existing rates of nitrogen deposition to the 'Great Bitterns' habitat, 'Rich Fens'.

Table 1: Critical Loads and Nitrogen Deposition Rates to Sensitive Habitats in Lee Valley SPA / Ramsar site

Relevant Nitrogen Critical Load Class	Critical Load (kg N/ha/yr)	Total Nitrogen Deposition (kg N/ha/yr)
Rich Fens	15-30	18.34[a]

[a] Deposition rates are provided by APIS as an average of modelled values for the 3 years between 2010-2012.

The APIS website also suggests recommended values within nutrient nitrogen critical load ranges for use in air pollution impact assessments. For rich fens the APIS website[3] states the following "*Use minimum of the range with all rich fens in the first instance in the absence of any UK evidence to support use of a higher value*". For the purposes of this assessment therefore a critical load of 15 kg N/ha/yr has been used for assessment purposes.

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[1] Highways Agency, Design Manual for Roads and Bridges, Volume 11, Section3, Part 1, HA 207/07, May 2007.
[2] www.apis.ac.uk
[3] http://www.apis.ac.uk/indicative-critical-load-values

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The information in Table 1 obtained from APIS suggests that the lower critical load for nitrogen deposition to Rich Fens is currently exceeded within the Lee Valley SPA / Ramsar site.

In previous years, estimated rates of nitrogen deposition have been provided for a future year (e.g. 2020), which has subsequently allowed nitrogen deposition rates to be interpolated for intermediate and future years. Currently however no future year nitrogen deposition rates are provided on the APIS website. In the absence of future year nitrogen deposition rates therefore, the values presented in Table 1 have been used in all assessment years, which is a worst-case assumption given that nitrogen deposition rates are expected to reduce over time due to decreasing emissions from road traffic and industry.

2.3 Assessment Methodology

2.3.1 Modelled Scenarios

Estimated volumes of traffic were provided for the existing scenario and for the year when the development is expected to be completed (2035). The following scenarios were therefore considered:

- the base year scenario, 2013, to represent the existing situation, which describes the current local road network;
- the Do-Minimum 2035 (DM 2035) scenario, which describes the local road network in 2035, without the proposed development; and
- the Do-Something 2035 (DS 2035) scenario, which describes the local road network in 2035 following completion of the proposed development.

2.3.2 Modelling Methodology

The Design Manual for Roads and Bridges (DMRB) Screening Method[4] was used to predict the effect of road traffic associated with the proposed development on nitrogen deposition rates affecting sensitive ecosystems, in accordance with the methodology proposed within the DMRB for the assessment of designated sites.

Given current concerns regarding future year road traffic NOx emission projections however, 2013 emission rates have been used in all modelled scenarios. This is a worst-case assumption, given that road traffic NOx emissions are likely to improve in the future due to improved vehicle technology, and will therefore provide a conservative estimate of the potential effects of the proposed development on rates of nitrogen deposition.

2.3.3 Background Pollutant Concentrations

A large number of small sources of air pollutants exist, which individually may not be significant, but collectively, over a large area, need to be considered in the modelling process. The emissions from these background sources were applied to the model as background concentrations.

Baseline background concentrations were estimated using mapped background NO_2 concentrations published by Defra[5] for the 1 km grid squares within the study area, as shown in Table 2. Again in order to provide a conservative assessment no improvement in background concentrations was allowed for in future years.

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[4] Highways Agency, Design Manual for Roads and Bridges Screening Method, Version 1.03c, July 2007.

[5] Defra (2012). 2010 Based Background Maps for NO_x, NO_2, PM_{10} and $PM_{2.5}$. Available at http://laqm.defra.gov.uk/maps/maps2010.html.

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Table 2: Mapped Background Pollutant Concentrations in the Study Area

Grid Reference		2013 Mapped Background NO_2 Concentration ($\mu g/m^3$)
X	Y	
542500	210500	14.8
538500	214500	12.9
539500	214500	12.1
540500	214500	11.8
541500	214500	12.1
542500	214500	11.7
538500	213500	12.8
539500	213500	12.3
540500	213500	12.2
541500	213500	12.4
542500	213500	12.1
538500	212500	13.5
539500	212500	13.2
540500	212500	13.2
541500	212500	12.9
542500	212500	12.8
538500	211500	16.7
539500	211500	15.9
540500	211500	15.4
541500	211500	15.3
542500	211500	15.3
538500	210500	16.4
539500	210500	16.6
540500	210500	15.1
541500	210500	15.0
Average		**13.8**

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2.3.4 Conversion of NO_X to NO_2

The proportion of NO_2 in NO_X varies greatly with location and time according to a number of factors including the amount of ozone (O_3) available and the distance from the emission sources. A spreadsheet tool[6] has therefore been produced for converting NO_X to NO_2 for any given year. The calculation tool incorporates the impact of expected changes in the fraction of NO_X emitted as NO_2 (f-NO_2) and changes in regional concentrations of NO_X, NO_2 and O_3. For the purpose of this assessment the 'All other urban UK traffic" mix was chosen as the best representation of the NO_2/NO_X relationship for East Hertfordshire.

2.4 Assessment Criteria

In the absence of formal criteria which can be used to assess the significance of predicted effects on rates of nitrogen deposition to sensitive ecosystems, screening criteria proposed the Environment Agency[7] have been used to determine whether predicted effects have the potential to be significant.

The Environment Agency suggests that for nature conservation sites, effects can be considered insignificant if they contribute less than 1% of the relevant critical load. Predicted impacts on nitrogen deposition rates in the Lee Valley SPA / Ramsar site of less than 0.15 kg N/ha/yr can therefore be considered not significant.

[6] NOX from NO2 Calculator, 2013. Available from http://laqm.defra.gov.uk/tools-monitoring-data/no-calculator.html.
[7] Environment Agency, H1 Environmental Risk Assessment, Annex F – Air Emissions, December 2011.

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3 Results

Predicted annual mean nitrogen deposition rates in each scenario at receptors positioned along a transect across the Lee Valley SPA / Ramsar site are shown in Table 3. The location of these receptors can be seen in Figure 2 of Appendix A.

Table 3: Predicted Nitrogen Deposition Rates affecting Lee Valley SPA / Ramsar site

Distance from SPA / Ramsar Site Boundary (metres)	Predicted Nitrogen Deposition Rate (kg N/ha/yr)			Predicted Impact (kg N/ha/yr)
	2013	2035 DM	2035 DS	2035 DS – 2035 DM
0	19.27	19.41	19.50	0.09
20	18.90	18.99	19.04	0.06
40	18.67	18.73	18.76	0.04
60	18.53	18.56	18.58	0.02
80	18.44	18.46	18.47	0.01
100	18.38	18.40	18.40	0.01

The results in Table 3 indicate that whilst the lower critical load for Rich Fens (15 kg N/ha/yr) is predicted to be exceeded in the Lee Valley SPA / Ramsar site in all assessment scenarios, the predicted impacts of road traffic emissions associated with the proposed GPE development are less than 0.15 kg N/ha/yr at all modelled receptors. The predicted effect of the proposed development on nitrogen deposition rates within the Lee Valley SPA / Ramsar site can therefore be considered **not significant**.

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Environment

4 Conclusions

An assessment was undertaken to gauge the potential impacts of increased road traffic movements associated with the proposed GPE development on rates of nitrogen deposition to sensitive ecosystems within the Lee Valley Special Projection Area (SPA) / Ramsar site and Epping Forest Special Area of Conservation (SAC).

The results of this assessment indicate that the effect of increased road traffic movements associated with the proposed development on nitrogen deposition rates to sensitive ecosystems within both designated nature conservation sites are likely to be **not significant**.

Capabilities on project:
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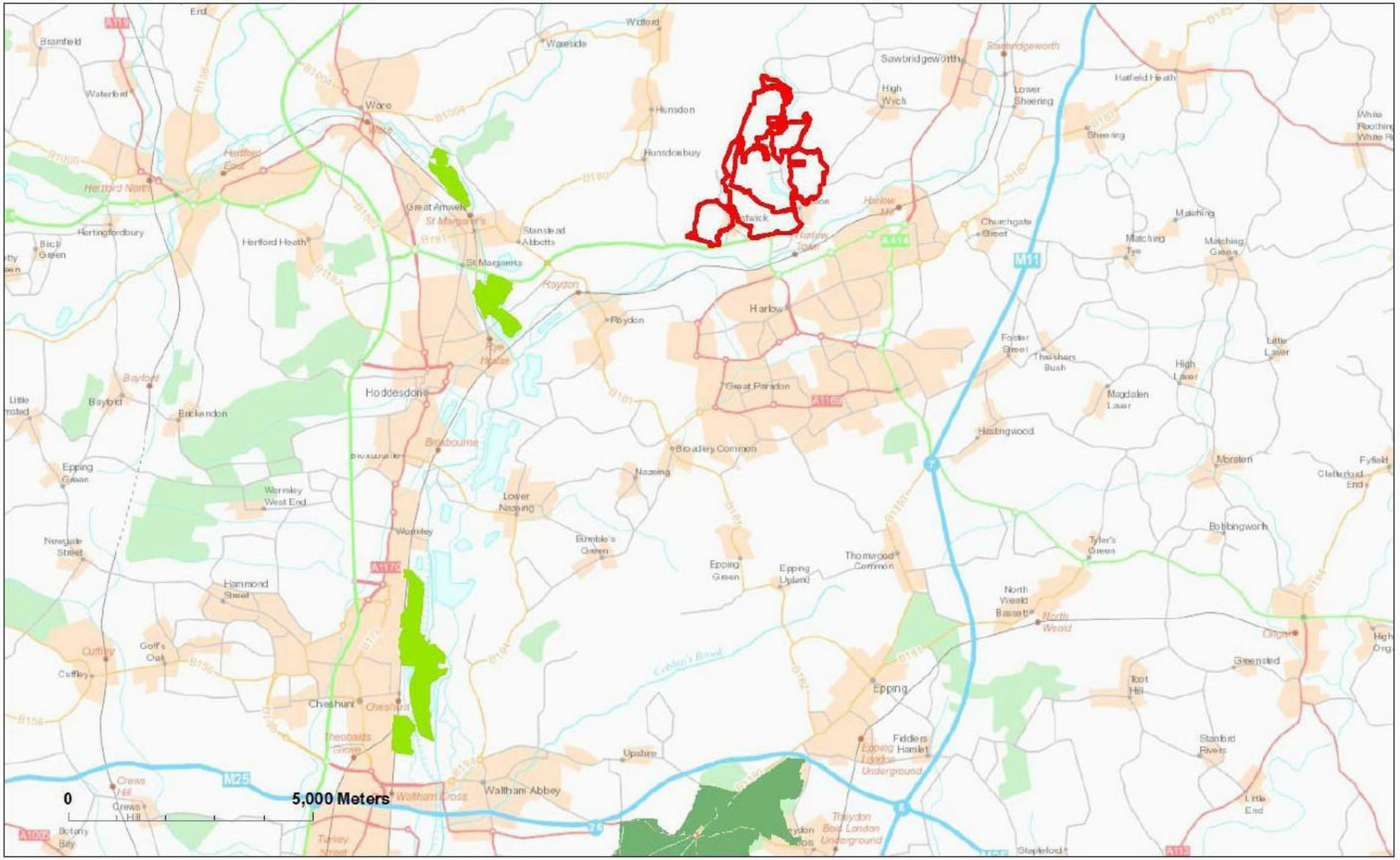
Appendix A - Figures

Capabilities on project:
Environment

Figure 1: Location of Designated Ecological Sites in Relation to Proposed Development Site



Designated Ecological Sites in Relation to Approximate Site Boundary

Legend

- Development Site Boundary
- Epping Forest SAC
- Lee Valley SPA / Ramsar Site

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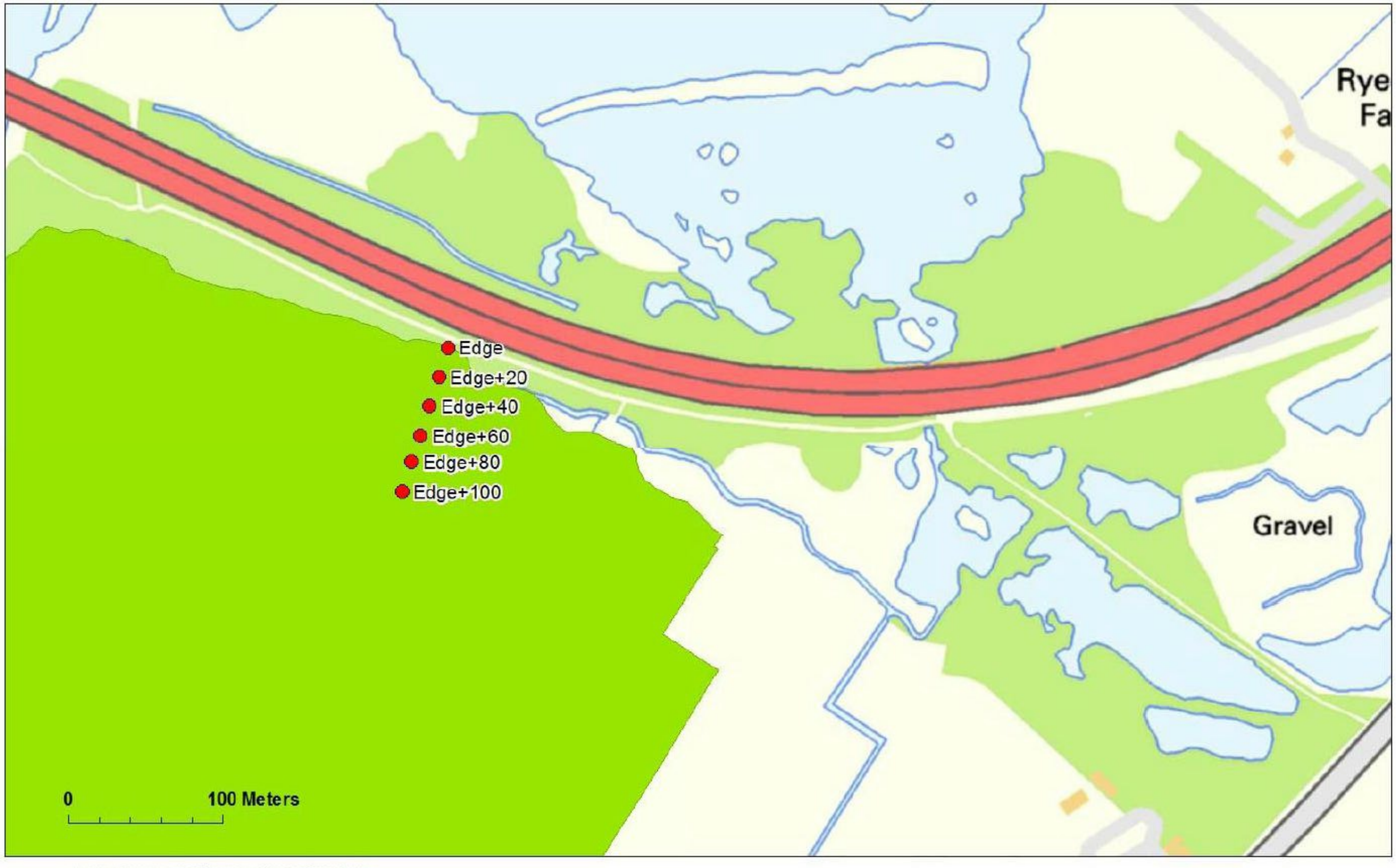
Figure 2: Modelled Receptors



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Modelled Receptors in Lee Valley SPA / Ramsar Site

Legend
- Modelled Receptors
- Lee Valley SPA / Ramsar Site

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Appendix B – Traffic Data

Traffic data for the modelling of road traffic sources were obtained from Vectos Ltd. The traffic data used in this assessment is provided in Table 4.

Table 4: Traffic Data Used in this Assessment

Road Name	Annual Average Daily Traffic (AADT)				Heavy Duty Vehicles (%)	Average Speed (kph)
	2013	2035 DM	2035 DS	Impact 2035		
A414 West of Harlow EB	14,022	18,366	22,412	4,046	5.9%	90
A414 West of Harlow WB	14,135	18,514	22,566	4,053	9.4%	73
M25 between J26 and J27 EB	56,282	73,718	73,926	207	14.6%	80
M25 between J26 and J27 WB	55,948	73,280	73,487	207	14.6%	80

It should be noted that the traffic data In Table 4 have been derived based on a simplified methodology with the following assumptions:

1. Base (existing) flows from either Automatic Traffic Count data (where available) or Highways Agency data
2. Growth rates applied to base flows to provide a future year
3. Development flows are based on a total of 10,000 homes which is the upper bound of housing provision.
4. The trip rates used in 3 above are the rates applied by Essex County Council in the strategic model.
5. Distribution of development trips is based on a review of census data and journey to work proportions (which generally give a reasonable picture of all trip types) for census areas close to the site. However, the assignment to routes is an estimate and neither distribution nor assignment take account of other factors that will ultimately be included in the strategic models (such as congestion, reassignment, location of jobs/services etc).
6. Development trips have been added to the future year flows, inclusive of growth, even though some of that growth may be attributable to the GPE development itself. It is not possible at this stage to establish what allowances, if any, for GPE are included in the growth assumptions.

These flows are therefore estimates at this stage but will be refined in due course as the results of strategic modelling become available.