Annex 10

Havering
LONDON BOROUGH

CABINET MEETING
19th JULY 2017

HAVERING LOCAL PLAN

HABITATS REGULATION ASSESSMENT 2017

Havering Local Plan

Habitats Regulations Assessment

London Borough of Havering

Project Number: 60494252

June 2017

FINAL

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
0.1	31/03/2017	First Draft	JR	James Riley	Associate
0.2	14/06/17	Consultation version	JR	James Riley	Associate

Distribution List

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1. Introduction

1.1 Background to the Project

AECOM was appointed by the London Borough of Havering to assist the Council in undertaking a Habitats Regulations Assessment of its Local Plan (hereafter referred to as the 'Plan' or 'Local Plan'). The objective of this assessment was to identify any aspects of the Plan that would cause an adverse effect on the integrity of Natura 2000 sites, otherwise known as European sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and, as a matter of Government policy, Ramsar sites), either in isolation or in combination with other plans and projects, and to advise on appropriate policy mechanisms for delivering mitigation where such effects were identified.

1.2 Legislation

The need for Appropriate Assessment is set out within Article 6 of the EC Habitats Directive 1992, and interpreted into British law by the Conservation of Habitats and Species Regulations 2010. The ultimate aim of the Directive is to "*maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest"* (Habitats Directive, Article 2(2)). This aim relates to habitats and species, not the European sites themselves, although the sites have a significant role in delivering favourable conservation status.

The Habitats Directive applies the precautionary principle to European sites. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. Plans and projects with predicted adverse impacts on European sites may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the site network.

In order to ascertain whether or not site integrity will be affected, an Appropriate Assessment should be undertaken of the plan or project in question:

Box 1: The legislative basis for Appropriate Assessment

Habitats Directive 1992

Article 6 (3) states that:

"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually 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."

Conservation of Habitats and Species Regulations 2010

The Regulations state that:

"*A competent authority, before deciding to … give any consent for a plan or project which is likely to have a significant effect on a European site … shall make an appropriate assessment of the implications for the site in view of that sites conservation objectives… The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site*".

Over time the phrase 'Habitats Regulations Assessment' (HRA) has come into wide currency to describe the overall process set out in the Habitats Directive from screening through to IROPI. This has arisen in order to distinguish the process from the individual stage described in the law as an 'Appropriate Assessment'. Throughout this report we use the term HRA for the overall process and restrict the use of Appropriate Assessment to the specific stage of that name.

1.3 Scope of the Project

There is no pre-defined guidance that dictates the physical scope of a HRA of a Plan document. Therefore, in considering the physical scope of the assessment, we were guided primarily by the identified impact pathways (called the source-pathway-receptor model) rather than by arbitrary 'zones'. Current guidance suggests that the following European sites be included in the scope of assessment:

- All sites within the Havering borough boundary; and,
- Other sites shown to be linked to development within the borough boundary through a known 'pathway' (discussed below).

Briefly defined, pathways are routes by which a change in activity provided within a Local Plan document can lead to an effect upon an internationally designated site. Guidance from the former Department of Communities and Local Government states that the HRA should be '*proportionate to the geographical scope of the [plan policy]*' and that '*an AA need not be done in any more detail, or using more resources, than is useful for its purpose*' (CLG, 2006, p.6). More recently, the Court of Appeal[1] ruled that providing the Council (competent authority) was duly satisfied that proposed mitigation could be '*achieved in practice'* to satisfy that the proposed development would have no adverse effect, then this would suffice. This ruling has since been applied to a planning permission (rather than a Core Strategy document)[2]. In this case the High Court ruled that for 'a multistage process, so long as there is sufficient information at any particular stage to enable the authority to be satisfied that the proposed mitigation can be achieved in practice it is not necessary for all matters concerning mitigation to be fully resolved before a decision maker is able to conclude that a development will satisfy the requirements of Reg 61 of the Habitats Regulations'.

There are no European sites that lie within London Borough of Havering. Outside the borough, the nearest European site is Epping Forest SAC located 6.5km to the north-west. This site is therefore discussed in the analysis for completeness.

The Thames Estuary and Marshes SPA and Ramsar site is located 10km south east of Havering. This was given preliminary consideration but is considered to be too far from the borough for Havering to form part of its core regular recreational catchment[3]. Wastewater impacts from London population growth were considered, but Thames Water have invested extensively in infrastructure (such as expansions to Beckton, Mogden and Crossness Sewage Treatment Works, the Lee Tunnel and the Thames Tunnel) to ensure that water quality in the River Thames (and thus the SPA/Ramsar site downstream) improves notwithstanding the expected increase in the population of the catchment of WwTW that discharge to the tidal river.

The reasons for designation of Epping Forest SAC, together with current trends in habitat quality and pressures on the sites are indicated in Chapter 5.

In order to fully inform the screening process, a number of recent studies have been consulted to determine likely significant effects that could arise from the Havering Local Plan. These include:

- Redbridge Local Plan 2015-2030 Pre-submission Draft (July, 2016)
- Redbridge Local Plan 2015-2030 Habitats Regulations Assessment (Argus Ecology, February 2017)
- Barking and Dagenham Core Strategy (DPD) 2010-2025 (July, 2010)
- Brentwood Draft Local Plan in Consultation (2016)
- Waltham Forest Local Plan Core Strategy (Adopted March, 2012)
- Enfield Local Plan Core Strategy (2010)
- Epping Forest District Draft Local Plan (October, 2016)
- Recreational activity, tourism and European site recreational catchment data.

[1] No Adastral New Town Ltd (NANT) v Suffolk Coastal District Council Court of Appeal, 17th February 2015
[2] High Court case of R (Devon Wildlife Trust) v Teignbridge District Council, 28 July 2015
[3] There does not appear to have been visitor survey of the part of the SPA in Thurrock but the much larger area of SPA in Kent has been surveyed and a core catchment of 6km has been identified. it is reasonable to assume that the Thurrock part of the SPA has a similar catchment (possibly smaller since the site itself is smaller and therefore possibly less appealing) in which case the main population centres of Havering would be well outside the core catchment as the closest (Cranham) is 13km away

- The UK Air Pollution Information System (www.apis.ac.uk)
- Thames Water's Final Water Resource Management Plan (WRMP) 2015-2040 (2014)
- Final Water Resources Management Plan, 2015-2020. Affinity Water) June 2014; and
- Multi Agency Geographic Information for the Countryside (MAGIC)and its links to SSSI citations and the JNCC website (www.magic.gov.uk)

1.4 This Report

Chapter 2 of this report explains the process by which the HRA has been carried out. Chapter 3 explores the relevant pathways of impact. Chapter 4 contains an initial sift of Local Plan policies to determine which present potential scope for impacts on European sites. Chapter 5 then provide more detailed screening (likely significant effects assessment) of each impact pathway. Each chapter begins with a consideration of the interest features and ecological condition of the site and of the environmental processes essential to maintain their integrity. An assessment of the Plan in respect of the European site is then carried out; mitigation strategies are proposed where necessary[4]. The key findings are summarised in Chapter 6: Overall Conclusions.

[4] Legal precedent confirms that it is perfectly acceptable to reference mitigation measures at the screening stage of HRA, if that is the stage at which they can be identified.

2. Methodology

2.1 Introduction

The HRA has been carried out in the continuing absence of formal central Government guidance, although general EC guidance on HRA does exist[5]. The former Department of Communities and Local Government (DCLG) released a consultation paper on the Appropriate Assessment of Plans in 2006[6]. As yet, no further formal guidance has emerged. However, Natural England has produced its own internal guidance[7] as has the RSPB[8]. Both of these have been referred to alongside the guidance outlined in paragraph 1.2.3 in undertaking this HRA.

Figure 1 below outlines the stages of HRA according to current draft DCLG guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until no significant adverse effects remain.

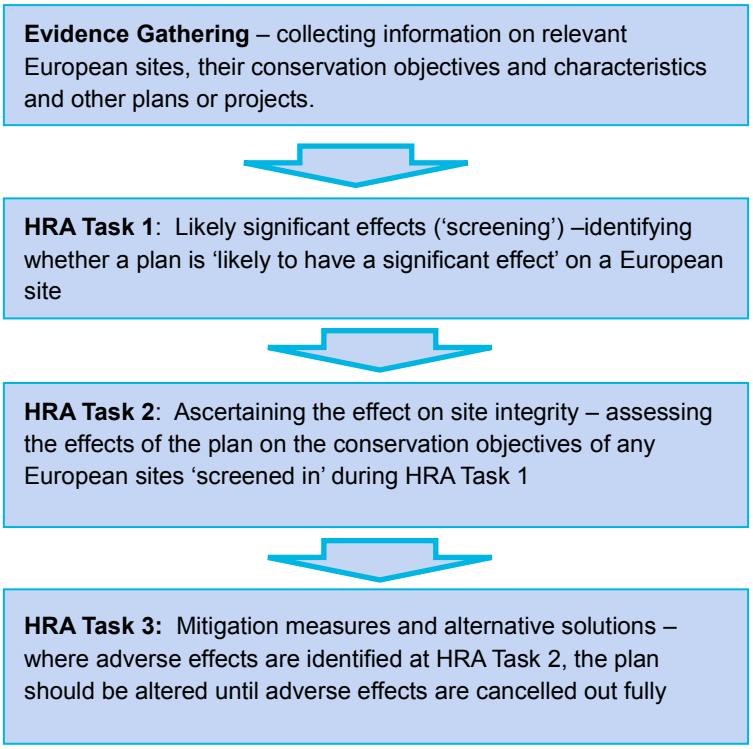


Figure 1: Four Stage Approach to Habitats Regulations Assessment. Source CLG, 2006.

2.2 HRA Task 1 – Likely Significant Effects (LSE)

Following evidence gathering, the first stage of any Habitat Regulations Assessment is a Likely Significant Effect (LSE) test - essentially a risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

"Is the Plan, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"

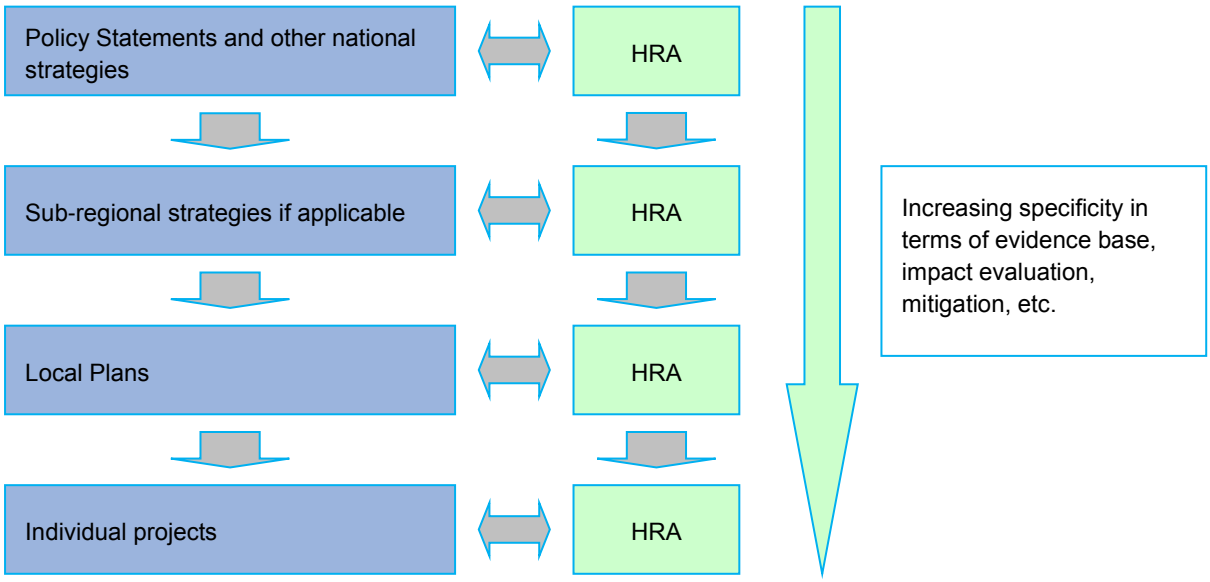
The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction with European sites.

[5] European Commission (2001): Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological Guidance on the Provisions of Article 6(3) and 6(4) of the Habitats Directive.
[6] CLG (2006) Planning for the Protection of European Sites, Consultation Paper
[7] http://www.ukmpas.org/pdf/practical_guidance/HRGN1.pdf
[8] Dodd A.M., Cleary B.E., Dawkins J.S., Byron H.J., Palframan L.J. and Williams G.M. (2007) *The Appropriate Assessment of Spatial Plans in England: a guide to why, when and how to do it.* The RSPB, Sandy.

In evaluating significance, AECOM have relied on our professional judgement as well as the results of previous stakeholder consultation regarding development impacts on the European sites considered within this assessment.

The level of detail in land use plans concerning developments that will be permitted under the plans will never be sufficient to make a detailed quantification of adverse effects. Therefore, we have again taken a precautionary approach (in the absence of more precise data) assuming as the default position that if an adverse effect cannot be confidently ruled out, avoidance or mitigation measures must be provided. This is in line with the former Department of Communities and Local Government guidance and Court rulings that the level of detail of the assessment, whilst meeting the relevant requirements of the Conservation Regulations, should be 'appropriate' to the level of plan or project that it addresses. This 'tiering' of assessment is summarised in Box 2.

Box 2: Tiering in HRA of Land Use Plans



When discussing 'mitigation' for a Local Plan document, one is concerned primarily with the policy framework to enable the delivery of such mitigation rather than the details of the mitigation measures themselves since the Local Plan document is a high-level policy document.

2.3 Principal Other Plans and Projects That May Act 'In Combination'

It is neither practical nor necessary to assess the 'in combination' effects of the Plan within the context of all other plans and projects within Havering and the neighbouring local authorities in Greater London. In practice, therefore in combination assessment is of greatest relevance when the plan would otherwise be screened out because its individual contribution is inconsequential. For the purposes of this assessment, we have determined that, due to the nature of the identified impacts, the key other plans and projects relate to the additional housing and commercial/industrial allocations proposed for other relevant authorities over the lifetime of the Local Plan, particularly those presented within Table 1 below;.

Table 1: Housing levels to be delivered across the surrounding authorities, provided for context.

Local Authority	Total housing provided
London Borough of Havering	17,550 new homes within plan period 2017 to 2031/2
London Borough of Enfield	11,000 new homes within plan period 2010/11 to 2024/25
London Borough of Waltham Forest	10,320 new homes within plan period 2011 to 2026
London Borough of Redbridge	16,845 new homes within plan period 2015 to 2030

London Borough of Barking and Dagenham	17,850 new homes within plan period 2010/11 to 2024/25
Brentwood Borough Council	7,240 new homes within plan period 2013 to 2033
Epping Forest District Council	11,400 new homes (subject to change) within the plan period 2011-2033

There are other plans and projects that are relevant to the 'in combination' assessment most notably Thames Water's Final Water Resource Management Plan (WRMP) 2015-2040 (2014). These are all taken into account in this assessment.

The Minerals and Waste Development Frameworks for Essex is also of some relevance, since it may well contribute to increased vehicle movements on the road network within East Herts (and thereby contribute to air quality impacts). The Essex Local Transport Plan to 2031 will also be important in influencing vehicle movements on the highways network in the short term. However, the major impact is likely to be that of housing and commercial development within the surrounding local authorities as set out in Local Plans and these have therefore been the main focus of cumulative 'in combination' effects with regard to this HRA. In this context, we have also consulted the London Plan (Consolidated with Alterations 2016).

In relation to recreational activity, the following documents have been consulted for their plans and projects that may affect European sites in combination with development in Havering: Epping Forest Management Plan and visitor surveys[9];

[9] At time of writing the Corporation of London have commissioned an analysis of their existing visitor survey data which is likely to identify a requirement for further surveys to refine the recreational catchment of Epping Forest SAC

3. Pathways of Impact

3.1 Introduction

In carrying out a HRA it is important to determine the various ways in which land use plans can impact internationally designated sites by following the pathways along which development can be connected with internationally designated sites, in some cases many kilometres distant. Briefly defined, pathways are routes by which change in activity associated with a development can lead to an effect upon an internationally designated site. Following screening of the Plan, the following impact pathways are considered within this document.

Impact pathways for consideration are:

- Recreational pressure
- Atmospheric pollution

3.2 Recreational pressure

Different types of internationally designated sites are subject to different types of recreational pressures and have different vulnerabilities. Studies across a range of species have shown that effects from recreation can be complex.

Most types of terrestrial internationally designated site can be affected by trampling, which in turn causes soil compaction and erosion. Walkers with dogs contribute to pressure on sites through nutrient enrichment via dog fouling and also have potential to cause greater disturbance to fauna as dogs are less likely to keep to marked footpaths and move more erratically. Motorcycle scrambling and off-road vehicle use can cause serious erosion, as well as disturbance to sensitive species.

There have been several papers published that empirically demonstrate that damage to vegetation in woodlands and other habitats can be caused by vehicles, walkers, horses and cyclists:

- Wilson & Seney (1994)[10] examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 108 plots along tracks in the Gallatin National Forest, Montana. Although the results proved difficult to interpret, it was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.

- Cole et al (1995a, b)[11] conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow and grassland communities (each tramped between 0 – 500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some recovery of the vegetation. Differences in plant morphological characteristics were found to explain more variation in response between different vegetation types than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular plants other than grasses, sedges, rushes and ferns) were considered least resistant. Cover of hemicryptophytes and geophytes (plants with buds below the soil surface) was heavily reduced after two weeks, but had recovered well after one year and as such these were considered most resilient to trampling. Chamaephytes (plants with buds above the soil surface) were least resilient to trampling. It was concluded that these would be the least tolerant of a regular cycle of disturbance.

- Cole (1995c)[12] conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampler weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier tramplers caused a greater reduction in vegetation height than lighter tramplers, but there was no difference in effect on cover.

[10] Wilson, J.P. & J.P. Seney. 1994. Erosional impact of hikers, horses, motorcycles and off road bicycles on mountain trails in Montana. *Mountain Research and Development* 14:77-88

[11] Cole, D.N. 1995a. Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. *Journal of Applied Ecology* 32: 203-214
Cole, D.N. 1995b. Experimental trampling of vegetation. II. Predictors of resistance and resilience. *Journal of Applied Ecology* 32: 215-224

[12] Cole, D.N. (1995c) Recreational trampling experiments: effects of trampler weight and shoe type. Research Note INT-RN-425. U.S. Forest Service, Intermountain Research Station, Utah

- Cole & Spildie (1998)[13] experimentally compared the effects of off-track trampling by hiker and horse (at two intensities – 25 and 150 passes) in two woodland vegetation types (one with an erect forb understorey and one with a low shrub understorey). Horse traffic was found to cause the largest reduction in vegetation cover. The forb-dominated vegetation suffered greatest disturbance, but recovered rapidly. Higher trampling intensities caused more disturbance.

The total volume of dog faeces deposited on sites can be surprisingly large. For example, at Burnham Beeches National Nature Reserve over one year, Barnard[14] estimated the total amounts of urine and faeces from dogs as 30,000 litres and 60 tonnes respectively. The specific impact on Epping Forest SAC has not been quantified from local studies; however, the fact that habitats for which the SAC is designated appear to be subject already to excessive nitrogen deposition, suggests that additional source of nutrient enrichment (including uncollected dog faeces) will make a cumulative contribution to overall enrichment. Any such contribution must then be considered within the context of other recreational sources of impact on sites.

3.3 Atmospheric Pollution

The main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia (NH3) and sulphur dioxide (SO2). NOx can have a directly toxic effect upon vegetation. In addition, greater NOx or ammonia concentrations within the atmosphere will lead to greater rates of nitrogen deposition to soils. An increase in the deposition of nitrogen from the atmosphere to soils is generally regarded to lead to an increase in soil fertility, which can have a serious deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats.

Table 2: Main sources and effects of air pollutants on habitats and species

Pollutant	Source	Effects on habitats and species
Acid deposition	SO2, NOx and ammonia all contribute to acid deposition. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, it is likely that increased N emissions may cancel out any gains produced by reduced S levels.	Can affect habitats and species through both wet (acid rain) and dry deposition. Some sites will be more at risk than others depending on soil type, bed rock geology, weathering rate and buffering capacity.
Ammonia (NH3)	Ammonia is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but levels have increased considerably with expansion in numbers of agricultural livestock. Ammonia reacts with acid pollutants such as the products of SO_2 and NOX emissions to produce fine ammonium (NH_4+) - containing aerosol which may be transferred much longer distances (can therefore be a significant trans-boundary issue.)	Adverse effects are as a result of nitrogen deposition leading to eutrophication. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH3 deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides NOx	Nitrogen oxides are mostly produced in combustion processes. About one quarter of the UK's emissions are from power stations, one-half from motor vehicles, and the rest from other industrial and domestic combustion processes.	Deposition of nitrogen compounds (nitrates (NO_3), nitrogen dioxide (NO_2) and nitric acid (HNO_3)) can lead to both soil and freshwater acidification. In addition, NOx can cause eutrophication of soils and water. This alters the species composition of plant communities and can eliminate sensitive species.
Nitrogen (N) deposition	The pollutants that contribute to nitrogen deposition derive mainly from NOX and NH_3 emissions. These pollutants cause acidification (see also acid deposition) as well as eutrophication.	Species-rich plant communities with relatively high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication, due to its promotion of competitive and invasive species which can

[13] Cole, D.N., Spildie, D.R. (1998) Hiker, horse and llama trampling effects on native vegetation in Montana, USA. *Journal of Environmental Management* 53: 61-71

[14] Barnard, A. (2003) Getting the Facts - Dog Walking and Visitor Number Surveys at Burnham Beeches and their Implications for the Management Process. *Countryside Recreation*, 11, 16 - 19

		respond readily to elevated levels of N. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O_3)	A secondary pollutant generated by photochemical reactions from NOx and volatile organic compounds (VOCs). These are mainly released by the combustion of fossil fuels. The increase in combustion of fossil fuels in the UK has led to a large increase in background ozone concentration, leading to an increased number of days when levels across the region are above 40ppb. Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	Concentrations of O_3 above 40 ppb can be toxic to humans and wildlife, and can affect buildings. Increased ozone concentrations may lead to a reduction in growth of agricultural crops, decreased forest production and altered species composition in semi-natural plant communities.
Sulphur Dioxide SO_2	Main sources of SO_2 emissions are electricity generation, industry and domestic fuel combustion. May also arise from shipping and increased atmospheric concentrations in busy ports. Total SO2 emissions have decreased substantially in the UK since the 1980s.	Wet and dry deposition of SO_2 acidifies soils and freshwater, and alters the species composition of plant and associated animal communities. The significance of impacts depends on levels of deposition and the buffering capacity of soils.

Sulphur dioxide emissions are overwhelmingly influenced by the output of power stations and industrial processes that require the combustion of coal and oil. Ammonia emissions are dominated by agriculture, with some chemical processes also making notable contributions. NOx emissions, however, are dominated by the output of vehicle exhausts (more than half of all emissions). Within a 'typical' housing development, by far the largest contribution to NOx (92%) will be made by the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison[15]. Emissions of NOx could therefore be reasonably expected to increase as a result of greater vehicle use as an indirect effect of housing development, but the relevance of emissions from growth in particular areas will be influenced by the relative distance from the site and the likely trip generation.

[15] Proportions calculated based upon data presented in Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. http://www.airquality.co.uk/archive/index.php

4. Initial Policy Sift

A detailed policy by policy analysis is presented in Appendix A, which focusses on those policies which cannot obviously be dismissed due to a clear absence of impact pathways (e.g. affordable housing, specialist housing, eating and drinking etc. clearly pose no risk to European sites). In summary, the following Policies have been screened out as presenting no potential for likely significant effects on European sites:

- **Affordable Housing** – this policy sets out the councils stance on the requirements for affordable housing within all new developments of over 10 dwellings or where the development sites is more than 1,000m^2 in area.
- **Housing Mix** – this policy sets out the councils stance on the requirements for developments to provide a mix of dwelling types sizes and tenures and that standards align with the London Plan (March 2015) and the GLA's Housing SPG (March 2016).
- **Specialist Housing** – this policy sets out the councils stance on the requirements for developing appropriate housing to meet the specialist needs of local people.
- **Residential design and amenity –** this policy sets out the provisions to protect the amenity of existing residents and requirements to ensure high quality living environments for residents of new developments.
- **Houses in Multiple Occupation –** this policy sets out the councils stance on the requirements for developing existing properties into houses in multiple occupation (HMOs) in order to prevent adverse impacts on the surrounding area and existing residents and to ensure a principle of mixed communities are not undermined.
- **Conversions and Subdivisions –** this policy sets out the councils requirements for converting existing houses to multiple self-contained homes and conversion of commercial floor space to residential use.
- **Gypsy and Traveller Accommodation –** this policy sets out the council's stance on the provision for current and future accommodation needs of Gyspies, Travellers and Travelling Showpeople.
- **Town Centre Development** – this policy seeks to enhance vibrancy of town centres, maintaining their important role for local communities.
- **Eating and Drinking** – this policy sets out the councils requirements for development and use of existing commercial/retail space for restaurants and takeaways.
- **Culture and Creativity –** this policy promotes protection and enhancement of the boroughs cultural assets and encourages proposals to promote community engagement and increased social inclusiveness.
- **Social Infrastructure** – this policy sets out the councils requirements for providing social infrastructure within and residential development in order to provide all new and existing residents with appropriate facilities.
- **Education -** this policy supports the expansion of primary and secondary schools where they help deliver the councils agreed strategy for provision of additional school places in the borough.
- **Loss of Industrial Land –** this policy supports the continued use of industrial land for such purposes unless it can be demonstrated that the loss will not lower the industrial capabilities of the borough or that there is no market interest for the site following one year of continuous active marketing.
- **Affordable workspace** – this policy promotes the incorporation affordable work space within new commercial and mixed development schemes. Where on-site provision is not possible, financial contributions for equivalent off-site provision will be sought.
- **Skills and training** – this policy supports proposals that will provide employment and skills development opportunities for the local residents of the borough.
- **Transport connections** – this policy supports a sustainable pattern of development in the borough by reducing the need to travel and offering a choice of transport modes to residents and visitors. The policy

also supports development which demonstrates adverse impacts on the transport network are avoided or mitigated where necessary.

- **Parking Provision and Design -** this policy sets out the requirements of the council to developers for providing sufficient car and cycle parking in accordance with parking standards of the London Plan.

- **Digital connections** – this policy supports the promotion and enhancement of connectivity of the borough through delivery of high speed broadband and telecommunication services.

- **Urban design –** this policy ensures the promotion and enhancement of the boroughs character and local distinctiveness.

- **Landscaping –** this policy promotes greening though the planting of trees and other soft landscaping and promotes the protection and enhancement of biodiversity.

- **Heritage assets –** this policy seeks to sustain or enhance significant heritage assets and maintain Conservation Areas, listed buildings, registered parks and gardens and areas with archaeological significance.

- **Flood management –** this policy sets out requirements for developments to, where reasonable, incorporate flood risk reduction measures and protect developments from increased risk of flooding.

- **On-site waste management –** this policy sets out the councils requirements around waste management, reuse, composting and recycling and waste disposal for new developments.

- **Low carbon design, decentralised energy and renewable energy –** this policy seeks to optimise the energy efficiency of buildings and supports low carbon and renewable energy developments in principle.

- **Mineral reserves** – this policy seeks to safeguard mineral reserves in the borough from other forms of development that would sterilise the resource and/or prejudice future mineral extraction.

- **Mineral extraction** – this policy sets out the requirements in order to protect the borough where mineral extraction activities are taking place.

- **Secondary aggregates –** this policy sets out the requirements in order to minimise the quantity of primary aggregate and resources necessary to facilitate a development and the amount of waste generated.

However, Policies Romford Strategic Development Area, Rainham and Beam Park Strategic Development Area, Housing Supply and Business Growth, do present theoretical pathways for impacts, largely because they govern the quantum and location of new development.

Having completed the initial sift of policies, impact pathways are now discussed in more detail in the following chapters.

5. Epping Forest SAC

5.1 Introduction

Epping Forest SAC is located approximately 6.5km north-east of the London Borough of Havering. 70% of the 1,600 hectare site consists of broadleaved deciduous woodland, and it is one of only a few remaining large-scale examples of ancient wood-pasture in lowland Britain. Epping Forest supports a nationally outstanding assemblage of invertebrates, a major amphibian interest and an exceptional breeding bird community.

5.2 Features of European interest[16]

Epping Forest qualifies as a SAC for both habitats and species. Firstly, the site contains the Habitats Directive Annex I habitats of:

- Beech forests on acid soils with *Ilex* and sometime *Taxus* in the shrub-layer.
- Wet heathland with cross-leaved heath; and
- Dry heath

Secondly, the site contains the Habitats Directive Annex II species Stag beetle *Lucanus cervus*, with widespread and frequent records.

5.3 Conservation objectives

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site

5.4 Current pressures and threats[17]

- Air pollution
- Under grazing
- Public disturbance
- Changes in species distribution
- Inappropriate water levels
- Water pollution
- Invasive species
- Disease

5.5 Potential Effects of the plan

Two potential effects of the Local Plan document upon the SAC have been identified.

- Recreational Pressure
- Air Pollution

[16] JNCC (2015) Natura 200 Standard Data Form: Epping Forest SAC
[17] Natural England (2015). Site Improvement Plan: Epping Forest SAC

The impact pathways discussed in the following sections are inherently 'in combination' (i.e. Havering is discussed in terms of its contribution to the totality of impact arising from numerous authorities) and therefore a specific separate 'in combination' assessment is not provided.

5.5.1 Recreational Pressure

Epping Forest SAC receives a great many visits per year (estimated at over 4 million) and discussions with the Corporation of London have identified long-standing concerns about increasing recreational use of the forest resulting in damage to its interest features. A programme of detailed formal visitor surveys has been undertaken in recent years. Analysis of data from 2014 was undertaken by Footprint Ecology in September 2016[18]. This further analysis identified that 89% of survey respondents originated from within 5km of the SAC and 76% originated from within 4km. Some uncertainties with the data were identified as follows:

- It is not clear to what extent the postcodes reflect a random sample of visitors due to the nature of the survey method, which enabled completion online as well as collection of data from people who attended the visitor centres, rather than based on encounters with people on footpaths and at car parks across the site. Therefore, although the scale of response is good, respondents are a self-selecting group to some extent. However, in order to try and address this staff and volunteers targeted visitors from the harder to reach groups such as under 16s, ethnic minorities, the elderly and disabled, at the busier locations with the hard copy version to be completed by themselves or with help from staff and volunteers; and

- The data show an uneven distribution of postcodes from which visitors originated. It showed that the southern portion of Epping Forest SAC (427ha of the total area of 2476ha), receives more than half of visitors, who focus on a few key honeypot sites (Wanstead Flats, Bush Wood, Wanstead Park, Hollow Ponds, Connaught Water and High Beach), with the northern portion of the SAC receiving a smaller proportion of visitors. This is not really surprising given that far more people live within 5km of the southern part of the SAC than the northern part. However, it does mean that, while the data indicate that 89% of 2014 survey respondents live within 5km this may over-estimate the catchment for the northern part of the SAC within Epping Forest district.

It should be noted that the distances mentioned above are distances measured from the SAC boundary because interview location wasn't always known and in many cases questionnaires were completed online or at visitor centres rather than out on site. This survey therefore applied a slightly different method to those for other European sites, where visitor origin data has been typically been presented as the distance between the interview location (which is usually an entry point such as a car park) and home postcode. This doesn't change the distribution of respondents' post-codes around Epping Forest SAC, but means that the catchment information from the Epping Forest visitor surveys is not directly comparable to data collected on other European sites by other methods.

However, the distribution of postcodes revealed by the analysis seems logical and intuitive as a 5km zone would cover all the larger settlements surrounding the SAC. There is therefore no reason to assume that the core catchment is either much larger or much smaller. Based on the existing analysis and settlement patterns around the SAC it is reasonable to expect that most regular visitors to the SAC are likely to derive from the London Boroughs of Waltham Forest, Enfield, and Redbridge and the following main settlements in Epping Forest District: Chigwell, Buckhurst Hill, Loughton, Theydon Bois, Epping and Waltham Abbey. The London Borough of Havering is located 6.5km from Epping Forest SAC at its closest, with the nearest settlement (Collier Row) being 7.6km from Epping Forest SAC as the crow flies or approximately 11-15km by road (depending on route taken). As such all available evidence indicates that Havering is unlikely to contribute materially to visitor pressure in Epping Forest SAC. Moreover, Collier Row has the Havering Forest Country Park and Bedford's Park immediately adjacent and Hainault Country Park, Dagnam Park and Page's Wood nearby, which are all much more convenient attractions for resident's wishing to visit a countryside or woodland site. Unlike some London Boroughs, Havering is not short of natural recreational greenspace open to the public. As such, no likely significant effect is anticipated through this pathway, alone or in combination.

[18] Footprint Ecology (2016). Initial review of current visitor data for Epping Forest

5.5.2 Air Quality

It is acknowledged that air pollution may cause a significant ecological effect within 200m of a road through emissions and related nitrogen deposition from vehicle exhausts and Epping Forest SAC has been shown to be affected by traffic-related emissions (specifically NOx concentrations and nitrogen deposition and possibly also ammonia) arising from the local road network (those roads within 200m of the SAC). Future local emissions will be most dictated by those areas that are the biggest contributors to 'journey to work' flows on roads through the SAC[19]. The increase in housing development within the London Borough of Havering is likely to increase the number of cars on the road network, which will contribute to air pollution generally. However, the degree to which Havering contributes specifically to journey to work flows through the SAC is the most important factor in considering what contribution growth in the borough is likely to make to changing air quality within the SAC, rather than simply the quantum of development being delivered in the borough.

The nearest settlement to Epping Forest SAC within the London Borough of Havering is Collier Row, approximately 7.6km distant as the crow flies and up to 15km by road (depending on route taken and location of housing). Such distances mean that there are many opportunities for vehicles to disperse across the network elsewhere into London (or out of London) rather than travelling through Epping Forest SAC. It is also noted that journeys to work within the London boroughs tend to be relatively short for the majority of London-resident commuters compared to other parts of the country and London offers an extensive network of alternative public transportation methods[20]. Data from the 2011 census indicates that the major journey to work destination for residents of Havering (outside the borough itself) is Westminster (20% of journeys), which accounted for double the number of journeys of the next most popular destination. Westminster, Barking & Dagenham, Tower Hamlets, Thurrock and Newham collectively accounted for 53% of all journeys to work arising from Havering. In contrast, Waltham Forest and Epping Forest District accounted for less than 4% of journeys to work between them and only c. 33% of those visits would have been by private car, van or motorbike (i.e. just over 1% of all journeys to work arising from Havering). It is not known how many of that 1% might travel past Epping Forest SAC on their journey but given the number of available routes that do not pass the SAC it is likely to be a small proportion[21].

Therefore, all the available evidence indicates that very few new journeys to work arising from additional development in Havering are likely to involve routes through Epping Forest SAC. Therefore the borough's contribution 'in combination' will undoubtedly be very small. Havering Council are introducing several policies that are likely to either further reduce journeys to work out of the borough (such as through delivering new employment development within the borough) or improve air quality either by requiring air quality neutrality from new development or by improving public transport links within the borough and to the main journey to work destinations. Policy Air Quality and Policy Managing Pollution seeks to make sure the new development is at least air quality neutral[22] and delivers measures to support active travel to reduce pollution concentrations and exposure. Policies to increase business and therefore employment within the borough (Policies Rainham and Beam Park Strategic Development Area and Business Growth) should further reduce the number of residents journeying out of the borough to work, as will new sustainable transport initiatives mentioned in Policies Romford Strategic Development Area, Rainham and Beam Park Strategic Development Area and Transport Connections, such as improved public transport access to central London via Crossrail services at Romford, Harold Wood and Gidea Park Stations and a new station at Beam Park on the C2C line, the A127 Corridor for Growth project and improved north-south links within the borough, connecting Rainham and Beam Park, Romford and Harold Hill.

Moreover, it is also important to consider the improvements in background air quality that are expected nationally over the plan period. Although in recent years improvements have not kept pace with predictions, the general long-term trend in NOx has been one of improvement (particularly since 1990) despite an increase in vehicles on the roads[23]. There is every reason to believe that new initiatives such as the further roll-out of Euro6 standard vehicles and city-wide initiatives to improve air quality, as well as any decline in the popularity of diesel vehicles,

[19] Air quality impacts on vegetation from traffic occur over long time periods as a result of long-term (year on year) continuous exposure to pollutants. Therefore the number of regular journeys to work are the most significant factor in determining the contribution of a particular area or development

[20] For example, data from the 2011 census indicates that 33% of residents of London Borough of Havering travel to work by car, van or motorbike, which is substantially lower than for England & Wales as a whole (41%). Reference: https://www.nomisweb.co.uk/census/2011/QS701EW/view/1946157270?rows=cell&cols=rural_urban [accessed 08/06/17]

[21] Reference: https://www.nomisweb.co.uk/census/2011/WU03UK/chart/1132462387 [accessed 08/06/17]

[22] To enable the implementation of this policy, emission benchmarks have been produced for buildings' operation and transport across London based on the latest technology (including its effectiveness and viability). Developments that do not exceed these benchmarks will be considered by the Mayor of London to avoid any increase in NOx and PM emissions across London as a whole and therefore be 'air quality neutral'

[23] Emissions of nitrogen oxides fell by 69% between 1970 and 2015. Source: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/579200/Emissions_airpollutants_statisticalrelease_2016_final.pdf [accessed 08/06/17]

will result in improvement in background air quality, which could offset increases in emissions from a greater number of vehicles on the road network.

Considering the very small proportion of journeys to work that might involve traversing Epping Forest SAC, the initiatives Havering is introducing to either reduce the need to travel outside the borough to work or improve sustainable transport links and the context of expected improvements in background air quality over the Local Plan period, it is considered that the contribution of growth in Havering to vehicle flows (and thus changing air quality) through Epping Forest SAC will be negligible and thus would not contribute materially to any adverse effect in combination.

6. Conclusions

The two main development pressures on Epping Forest SAC are recreational pressure and atmospheric pollution.

However, due to the distance between Epping Forest SAC and the nearest settlement within the London Borough of Havering, it is considered that the increase in population in Havering is unlikely to significantly increase recreational pressure upon the SAC as the borough lies outside the core catchment of that SAC and has ample alternative semi-natural publically accessible woodlands. In addition policies in the Havering Local Plan promote the provision of local green infrastructure and open spaces, providing locals with much closer recreational alternatives to Epping Forest SAC.

Considering the very small proportion of journeys to work that might involve traversing Epping Forest SAC, the initiatives Havering is introducing to either reduce the need to travel outside the borough to work or improve sustainable transport links and the context of expected improvements in background air quality over the Local Plan period, it is considered that the contribution of growth in Havering to vehicle flows (and thus changing air quality) through Epping Forest SAC will be negligible and thus would not contribute materially to any adverse effect in combination.

It is possible to conclude that development in the Havering Local Plan will not have a likely significant effect on any internationally designated site either alone or in combination. It is therefore considered that no amendments to the Local Plan are required.

Appendix A Initial Policy Sift

The table below presents an initial sift of policies and allocations within the Local Plan, from the point of view of HRA. Only those which cannot obviously be dismissed due to an absence of linkages to European sites are discussed.

Policy	Policy summary	HRA implications needing consideration
Romford Strategic Development Area	Romford Strategic Development Area (SDA) encompasses Havering's largest Town Centre and is one of Outer London's major growth and regeneration areas. Residential Development This policy sets out that 5,300 new high quality homes will be delivered in the Romford SDA within the Plan period. Commercial Development To strengthen Romford's role as a Metropolitan Centre this policy supports initiatives to improve commercial development the refurbishment of existing retail and/or provide new modern retail units, diversification and improvement of the quality of retail, culture and leisure opportunities and the reinforcement of South Street as the main shopping street. To transform the Market Place into a high quality civic space and accommodate mixed uses by providing residential and new commercial floor space above ground level. To incorporate major regeneration schemes in Romford Town centre, including the Romford Station Scheme and Romford Market transformation. Transport Connectivity Romford is the most accessible and well connected area within the Borough. This policy supports delivery of Crossrail to Romford as well as new east-west pedestrian cycle links, improved accessibility to Romford Town Centre and improvements to the ring-road and links along the River Rom. It requires developers to improve active travel links between Romford Station, Waterloo Road and Bridge Close; and requiring proposals for development along the River Rom to improve the quality and setting of the river and to provide continuous, safe and accessible links alongside the river. Social Infrastructure This policy supports the expansion of existing schools in the area in line with the Council's Commissioning Plan and Schools Expansion Programme in addition to new primary and secondary schools in the area and the creation of a new health hub, including relocation of sexual health services into the Town Centre. Design and Heritage This policy promotes improvements to existing retail frontages and proposed pedestrian routes as well as contributing	This policy provides for both residential and employment focused development. Potential HRA implications dependant on sites allocated. The majority of this policy focuses on improving the existing development and infrastructure within Romford Town Centre to make the centre a more accessible and inviting location to improve economic growth within the borough. No HRA implications arise from the improvements to existing development and infrastructure within Romford SDA.

	toward public realm improvements in the Market Place and while responding positively to the sensitive nature and urban fabric within the conservation area and views of St. Edward the Confessor Church and historic crossroads.	
Rainham and Beam Park Strategic Development Area	Rainham and Beam Park SDA is a major growth and regeneration area. Residential Development This policy supports development of over 3,000 new homes within the Rainham and Beam Park SDA. The policy also supports the redevelopment of undesignated sites in Rainham District centre and wider SDA. Commercial Development This policy supports a new Local Centre at Beam Park Station which will provide 3,500 and 4,000 m^2 of new floor space for modern retail and commercial units integrated within the Station building. New developments will be required to incorporate generous floor to ceiling heights of 3.00-3.75m at ground level for flexibility and adaptability for conversion. Transport Connectivity This policy supports the establishment of Beam Park Station on the Essex Thameside Line; a new green neighbourhood that links the existing settlements of South Hornchurch and Orchard Village with Rainham Village in addition to transforming New Road into an attractive high quality green street. The policy also supports improved east-west travel connections and a link across Rainham Creek for buses as well as a new integrated network of walking and cycling routes connecting neighbourhoods, local facilities and open spaces. Supporting Infrastructure This policy supports the expansion of existing primary and secondary schools in line with the Council's Commissioning Plan as well as the expansion of Havering College's Rainham Campus, the development of a new primary school at Beam Park, provision of health facilities and improvement to sports and leisure facilities. Design Principles This policy states that new development should adhere to a set of common development and design principles to ensure successful transformation of the area, including; providing layouts that facilitate coherent urban structure across the area, link existing settlements better and overcome the barrier presented by the river. As well as designing buildings which provide a good sense of enclosure and that help to make the area both safe and welcoming and which enhance the character of the area.	This policy provides for both residential and employment focused development. Potential HRA implications dependant on sites allocated. This policy also supports the establishment of a new green neighbourhood which is likely to have a beneficial impact on local biodiversity and improve green corridors within the local area. Other areas of this policy focus on improving the existing development and infrastructure within Rainham and Beam Park SDA to make the area a more accessible and inviting location to improve economic growth within the borough. No HRA implications arise from the improvements to existing development and infrastructure within Rainham and Beam Park SDA.
Housing Supply	Ensuring an adequate housing supply to meet local and regional housing need is essential in ensuring that Havering is a place where people want to live and where residents are able to stay and prosper.	This policy provides for residential focused development. Potential HRA implications dependant on sites allocated.

	This policy sets out that over the plan period at least 17,550 new homes will be built in the following areas: - 5,300 in Romford SDA - 4,000 in Rainham and Beam Park SDA - 700 through intensification and renewal of existing Council housing estates - 400 homes on previously developed sites within the Green Belt - 2,790 on small sites across the borough The policy also states that the council will support appropriate development of infill, under-utilised and vacant sites, prioritising all non-designated land for housing when available, optimising residential output and densities with the density matrix set out in the London Plan, encouraging reuse of previously developed land, resisting net loss of residential development, promote mixed use development in town centres and out of town centre locations and supporting initiatives to bring back empty residential properties into use.	
Garden and Backland Development	This policy supports proposals for residential development on gardens and back-land sites when they : - Do not prejudice the future development of neighbouring sites; - Ensure good access and, where possible, retain existing through routes; - Retain and provide adequate amenity space for existing and new dwellings; - Do not have a significant adverse impact on the amenity of existing and new occupants.	Although this policy does not pose any HRA implications to European Sites this policy has the potential to cause a loss of biodiversity within the borough through the removal of garden greenspace. 24% of Greater London is private, domestic garden land of which it is estimated that 14% is vegetated green space. These vegetated garden areas are of high value to wildlife within a heavily built up area and it is recommended policies supporting removal of this habitat type take into consideration safeguards for biodiversity in the local area.
Healthy Communities	This policy supports proposals which provide opportunity for health lifestyles and contribution to the creation of healthier communities. The policy promotes environmental improvements, improving air quality and minimising exposure to pollutants, promotion of walking and cycling, promotion of active travel, provisioning for multifunctional green infrastructure and provision and protection of open space, leisure and recreational facilities. Promotion the diversification of uses within town centres and managing uses with negative health impacts such as betting shops and fast food takeaways. To avoid contributing to factors that affects climate change and to contribute to prevention measures for mitigating climate change. Developers are required to consider wider local/regional primary care strategies and to take into account how development can contribute to the objectives of those strategies.	No HRA implications. Provision of multifunctional greenspace and provisions and protection of open space, leisure and recreational facilities within the borough may have a beneficial influence through less people leaving the borough to visit greenspace and therefore reducing the number of visitors to Epping Forest SAC.
Open space, leisure	This policy promotes the creation/re-development of open space, leisure and recreational facilities when new	No HRA implications.

and recreation	development is created and resists the loss of existing designated open space, unless replacement is provisioned for. Where no sufficient provision can be made on-site developer contributions will be sought to create these facilities across the borough. Developments are required to provide children's play and informal recreation space on-site in line with the London Plan.	The creation and protection of open space and recreational facilities within the borough may have a beneficial influence through less people leaving the borough to visit greenspace and therefore reducing the number of visitors to Epping Forest SAC.
Business growth	This policy promotes building a strong and prosperous economy, by supporting development of Strategic Outer London Development Centres (SOLDC), protecting designated Strategic Industrial Locations (SILs) and Locally Significant Industrial Sites (LSISs), requiring large scale residential proposals to include flexible business space and supporting development of flexible business space for small and medium sized enterprises. As well as supporting development of a hotel in close proximity to Rainham Employment Area, supporting expansion of business in rural areas and creating an environment that attracts businesses and improves competitiveness of employment areas.	This policy provides for increased business and employment within the borough, which could lead to a net increase in traffic generation within and potentially surrounding the borough. Potential HRA Implications.
Green Infrastructure	This policy seeks to maintain and expand the network of green spaces and natural features in the borough. Including on site green infrastructure to new developments and compensation for any proposed loss of green space. Developers are expected to work with existing partnerships to support and enhance green infrastructure provision including; The All London Green Grid, Thames Chase Community Forest, Rainham Wildspace, Land of the Fanns Landscape Partnership and Roding, Beam & Ingrebourne Catchment Partnership	No HRA Implications. This is a protective and enhancement policy which along with other green infrastructure and biodiversity policies could potentially reduce the recreational pressure on Epping Forest SAC.
Nature Conservation	This policy seeks to protect and enhance biodiversity and geodiversity in the borough to provide benefits to both local wildlife and local residents, through protecting statutory designated sites, conserving and extending wildlife corridors, and through protecting veteran trees, ancient woodland and priority species and habitats.	No HRA Implications. This is a protective and enhancement policy which along with other green infrastructure and biodiversity policies could potentially reduce the recreational pressure on Epping Forest SAC.
Rivers and River Corridors	This policy seeks to enhance the river environment for biodiversity, recreation, place-making, amenity, freight transport and flood management.	No HRA Implications. This is a protective and enhancement policy which along with other green infrastructure and biodiversity policies could potentially reduce the recreational pressure on Epping Forest SAC.
Air Quality	This policy seeks to make sure the borough residents are not put at risk through health impacts relating to air quality. The council seeks to do this by only supporting development which;	No HRA Implications. This policy supports the Mayor's Sustainable Design and

	- Is at least air quality neutral - Delivers measures to support active travel to reduce pollution concentrations and exposure - Does not pose an unacceptable risk to the quality of the water catchment, groundwater or surface water - Optimises the use of green infrastructure to avoid pollution concentrations and exposure. - Minimises emissions from construction	Construction SPG linking back to the London Plan policy 7.14 Improving air quality, where it states development proposals should be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas (AQMAs)). The Mayor is committed to improving air quality in London and has put in place an ambitious strategy of measures to reduce air pollution and minimise human exposure in order to improve Londoner's health and quality of life. Areas that do not meet national air quality targets for nitrogen dioxide (NO_2) and particulate matter (PM_{10}) are designated Air Quality Management Areas (AQMA) as havering has been. The Mayor's Air Quality Strategy sets out how the Mayor proposes to reduce air emissions across London. Each borough with an AQMA has its own Air Quality Strategy and a detailed Air Quality Assessment will need to be submitted with a planning application for each development within the AQMA in order to assess air quality neutrality and highlight mitigation.
Managing Pollution	The council will support development proposals that: - Do not unduly impact upon amenity, human health and safety and the natural environment by noise, dust, odour and light pollution, vibration and land contamination; - Do not pose an unacceptable risk to the quality of the water catchment, groundwater or surface water; and optimise the design, layout and orientation of buildings and the use of green infrastructure to minimise exposure to the above pollutants.	No HRA Implications. This is a protective and enhancement policy which along with other green infrastructure and biodiversity policies could potentially reduce the recreational pressure on Epping Forest SAC.

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