M11 Junction 7A

Pre-application Scoping Report

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Appendices

Appendix A. Environmental Constraints

Appendix B. Harlow County Council Contamination Response

1. List of terms to ensure consistency

Description	Please use in text
The Client	Essex County Council
Us	Jacobs Consulting Ltd (Jacobs) the first time then refer to as Jacobs
The Council	Essex County Council (ECC)
The Site should be referred to as	M11 Junction 7A and Gilden Way link road
The development includes	Construction of new motorway junction for Harlow between Junctions 7 and 8 on the M11 and improvement of Gilden Way as a link road between the motorway and Harlow.
Study Area	The Study Area is shown in Appendix A and roughly bounded by: • Moor Hall Road/Sheering Road and a line 200mfrom Gilden Way to the south; • a strip of land directly to the east of the M11 motorway; • a line approximately 200m to the north of Pincey Brook, extending towards Watlington Road/New Road and High Street to the north; and • London Road to the west.

Acronym	Meaning
AADT	Annual Average Daily Traffic
AQMA	Air Quality Management Area
AQOs	Air Quality Objectives
AQS	Air Quality Strategy
ASNW	Ancient and Semi-Natural Woodland
BGS	British Geological Survey
CD&E	Construction, demolition and excavation
Defra	Department of Food and Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges

EECOS	Essex Ecology Services Limits
ECC	Essex County Council
EFC	Essex Field Club
EFDC	Epping Forest District Council
EHDC	East Hertfordshire District Council
EHER	Essex Historic Environment Record
EIA	Environmental Impact Assessment
ES	Environmental Statement
FRAZ	Flood Risk Assessment Zone
GCN	Great Crested Newt
GLVIA	Guidelines for Landscape and Visual Impact Assessment
HDC	Harlow District Council
HDV	Heavy Duty Vehicle
HSI	Habitat Suitability Index
IAN	Interim Advice Note
IEMA	Institute of Environmental Management and Assessment
LAQM	Local Air Quality Management reports
LPA	Local Planning Authority
LWS	Local Wildlife Sites
MAGIC	Multi Agency Geographic Information for the Countryside
NO2	Nitrogen Dioxide
NPPF	National Planning Policy Framework
NMUs	Non-Motorised Users
NVZ	Nitrate Vulnerable Zone
PM10	Fine particulate matter
PRoW	Public Rights of Way
PWV	Protected Wildlife Verge
SAC	Special Areas of Conservation
SPA	Special Protection Areas

SSSI	Sites of Special Scientific Interest
TPO	Tree preservation orders
UDC	Uttlesford District Council
UK BAP	UK Biodiversity Action Plan
USA	2015 Updating Review and Screening Assessment (HDC, 2015)
WFD	Water Framework Directive

2. Introduction

Jacobs are supporting Essex County Council (ECC) Local Highway Authority in the delivery of its objectives to improve the highway network across the County.

ECC (Major Programmes and Infrastructure) is developing a proposal for improving access to and from the M11 in the Harlow area. Harlow has only one connection to the Strategic Road Network (SRN) on the M11 via Junction 7 (J7), which is located to the south and east of the town. High levels of traffic access this one junction onto the M11 and much of this traffic passes through Harlow on the A414. Because of the single route into and around the town, congestion is common with impacts, even from minor incidents, often causing severe congestion across the town's road network. This is exacerbated by the location of the existing key employment areas, towards the north and west of the town (Edinburgh Way and Pinnacles), which creates further strain on the local road network, particularly along the A414.

The project is for the provision of a new motorway Junction 7A on the M11 between Junctions 7 and 8 and is supported by the proposed widening of Gilden Way.

Initial modelling work has shown that the existing Junction 7 is now at capacity. An increase in road network capacity is needed to support the level of committed and proposed new housing, and jobs required to meet future needs and support economic development and regeneration in Harlow and the surrounding areas. Without an improved link to the motorway, the town and surrounding districts will not be able to realise their full potential.

The proposed Junction 7A has the following objectives:

- to improve accessibility to and from Harlow;
- to reduce congestion primarily for the A414 corridor;
- to ensure the proposed infrastructure is the appropriate scale for future traffic demands; and
- to provide an opportunity for future housing developments and employment to the east of Harlow.

A series of Public Information Events on Scheme options and alternative choices that have been considered took place in July 2015. Formal public consultation will follow in March 2016. The approach to this consultation is set out in a separate Consultation Strategy. For the purposes of this report we have identified a Study Area to show where environmental survey work will be undertaken based on the proposed location of the potential Scheme.

2.1 Purpose of Environmental Report and Planning Statement

The purpose of this pre-application report is to obtain an informal pre-application view from the Local Planning Authority (LPA) on the proposal and proposed future environmental work which will be undertaken to support the preparation of a formal planning application for the proposed Scheme.

Informal comments are sought on the following matters:

- Whether the proposed Junction 7A raises any 'in principle' objections in planning terms that would impact on the submission of a planning application in November 2016;
- Whether the proposed environmental topics set out in this report, which will be considered as part of the planning application, cover all the issues which the LPA requires to be addressed;
- The proposed Study Area relating to the environmental topics (the area varies for some topics);

- The proposed scope of the assessment for each environmental topic;
- The outline methodology for evaluating each topic; and
- Any other comments that the LPA may wish to make on the information presented.

The Scheme will be likely to require an Environmental Impact Assessment (EIA) under the Town and Country Planning (EIA) Regulations 2011 Schedule 1 (7) as part of the proposal is a new road with 4 lanes of traffic. This report sets out a high level scope for the Environmental Impact Assessment work. A more detailed environmental scoping report will be submitted at a later date as part of a formal request for a scoping opinion. This will occur during the pre-application process in the spring of 2016. Any comments we receive will be used to inform a subsequent scoping report.

The following environmental topics are covered in this Report:

- Air Quality;
- Cultural Heritage;
- Landscape;
- Ecology and Nature Conservation;
- Geology and Soils;
- Materials;
- Noise and Vibration;
- Effects on All Travellers;
- Community and Private Assets;
- Road Drainage and the Water Environment; and
- Potential Cumulative Effects.

3. Approach to Assessment

3.1 General approach

High level information on potential environmental issues associated with the Scheme was presented as part of the public information events consultation process in July 2015 and formal public consultation will take place in March 2016. Following public consultation and the subsequent confirmation of a final preferred route, an EIA will be carried out by a team of environmental specialists. They will work closely with the design team to, as far as practicable, avoid or reduce through appropriate mitigation, potential negative environmental effects of the Scheme, while seeking positive environmental outcomes where possible.

It is proposed that the EIA will follow guidance set out in the Government's Design Manual for Roads and Bridges (DMRB) (Volume 11, Environmental Assessment)[1]. This is normal practice applied to Highways England schemes and was felt a particularly pertinent approach to follow here as the road improvement includes a motorway junction. It is proposed that the Interim Advisory Notes (IANs), which are supplementary to DMRB, are also used where appropriate.

Details of the outline methods that are proposed to be used for each individual environmental topic area are provided in the Chapters that follow.

3.2 Proposed Study Area

The proposed Study Area, derived using a proposed location for the route of the road, crosses both the Harlow District Council and Epping Forest District Council areas. The proposed Study Area is generally appropriate for the majority of environmental disciplines (shown in Appendix A). This area is roughly bounded by:

- Moor Hall Road/Sheering Road and a line 200mfrom Gilden Way to the south;
- a strip of land directly to the east of the M11 motorway;
- a line approximately 200m to the north of Pincey Brook, extending towards Watlington Road/New Road and High Street to the north; and
- London Road to the west.

However, some environmental disciplines (e.g. air quality, noise and vibration and ecology and nature conservation) could have slightly different study boundaries for the reasons explained in the respective environmental Chapters.

3.3 Data Gathering

At this early stage, only high-level information is presented within this report, much of which has been collected from a desk-based assessment of the existing baseline data and information. Previous studies by Mouchel[2] provided some initial baseline information. It is recognised that up to date data is important for a robust assessment, therefore publicly accessible data such as those available on the Harlow District Council, Epping Forest District Council, Natural England and the Environment Agency websites have also been utilised. An Envirocheck report, ecological data records and heritage records also informed the geology and soils (contaminated land), ecology and nature conservation and cultural heritage Chapters respectively. In some instances, for example ecology, more detailed field surveys have been undertaken and a summary of the results are presented within this report.

[1] Highways Agency, DMRB Volume 11: Environmental Assessment
[2] Mouchel, Environmental Constraints, Risks and Opportunities Study, M11 Junction 7A Harlow, November 2010

The scope of future data collection is defined in each of the different topic Chapters. These may include:

- consultation with third-party organisations including statutory consultees;
- desk based surveys; and
- field surveys.

3.4 Proposed Approach to Identifying Potential Impacts

Direct and indirect impacts arising from the proposed Scheme will be considered as part of the EIA process. Cumulative effects will also be identified.

It is proposed that, for most environmental topics, the significance of an impact is derived through combining the value or sensitivity of a receptor and the magnitude of that impact. Table 3.1 describes the proposed criteria for the value of an environmental resource and Table 3.2 describes the proposed criteria defining the magnitude of impact of a project. The significance of effects, as shown in Table 3.3 (below), is assigned by combining value or sensitivity with the magnitude of impact. This is based on informed professional judgement. Sensitivity of receptors and magnitude of impact is likely to vary slightly for each environmental issue. These definitions will be developed further based on baseline information and professional judgement for each environmental topic during the EIA process.

Table 3.1: Environmental value (or sensitivity) and typical descriptors (taken from Volume 11, Section 2, Part 5 of DMRB, 2008)

Value (sensitivity)	Typical descriptors
Very High	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	High or medium importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

Table 3.2: Magnitude of impact and typical descriptors (taken from Volume 11, Section 2, Part 5 of DMRB, 2008)

Magnitude of impact	Typical criteria descriptors
Major	Loss of resource and / or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse).

Magnitude of impact	Typical criteria descriptors
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of / damage to key characteristics, features or elements (Adverse).
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse).
	Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Significance categories will be required for positive (beneficial) as well as negative (adverse) effects; the proposed methodology is shown in Table 3.3. The five significance categories give rise to eight potential outcomes. Thus, the greater the environmental sensitivity or value of the resource, and the greater the magnitude of impact, the more significant the effect.

Table 3.3: Arriving at the significance of effect categories (taken from Volume 11, Section 2, Part 5 of DMRB, 2008)

Magnitude of Impact (Degree of Change)					
Environmental Value (Sensitivity)	**No Change**	**Negligible**	**Minor**	**Moderate**	**Major**
Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large

Magnitude of Impact (Degree of Change)					
Environmental Value (Sensitivity)	**No Change**	**Negligible**	**Minor**	**Moderate**	**Major**
High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Light or Moderate
Negligible	Neutral	Slight	Neutral or Slight	Neutral or Slight	Slight

3.5 Mitigation, Enhancement and Residual Effects

It is proposed to utilise guidance on environmental design and management that is provided within Volume 10 of the DMRB[3]. Where the Scheme potentially has an adverse impact on the environment, mitigation measures will be proposed to either eliminate the impact or reduce its significance. This could be as a result of Scheme design or as a consequence of the timing of specific activities. Elsewhere compensatory measures could be required if mitigation proved impossible. Where appropriate, mitigation measures will be developed in consultation with statutory consultees and / or other third parties. There could be some situations where it may be possible to enhance the local environment as a result of the Scheme design. In such situations the beneficial impacts of enhancements will be assessed.

[3] Highways Agency, DMRB, Volume 10, Environmental Design

4. Air Quality

4.1 Introduction

Air quality is measured in relation to the concentrations of certain pollutants in the air, taking into account the effects of pollution on human health and ecosystems.

Emissions from vehicle exhausts are a major contributor to these pollutant concentrations in Britain. In many areas, vehicle emissions are often the main source of air pollutants. Therefore, changes to road infrastructure can potentially affect air quality, as they can change the quantity, location and speed of road traffic in a local area. Consequently, air quality is a key topic and consideration in the environmental assessment of the potential impact of road improvement projects.

Air quality is comprised of three sub-topics:

- Local air quality - relates to pollutants with the potential to affect human health and ecosystems, both during construction of a scheme, and once it is operational;
- Regional air quality - relates to pollutants dispersing over a larger area, with the potential to affect human health and ecosystems; and
- Climate change - relates to the emission of greenhouse gases.

The National Air Quality Strategy 2007 (AQS) establishes Air Quality Objectives (AQOs) for a number of specific pollutants. It is proposed that the assessment considers the main air pollutants relating to road traffic, which are Nitrogen Dioxide (NO_2) and Fine Particulate Matter (PM_{10}). The relevant Air Quality Objective Limits are detailed in Table 4.1 below.

Table 4.1: Relevant Air Quality Objectives (AQOs)

Pollutant	Concentration	Measured as
Nitrogen Dioxide (NO_2)	40µg/m³	Annual mean
	200µg/m³	Hourly mean (not to be exceeded >18 times a year)
Particulates (PM_{10})	40µg/m³	Annual mean
	50µg/m³	24 hour mean (not to be exceeded >35 times a year)

It is proposed that the other pollutants in the AQS are screened out as being unlikely to be of concern.

Another proposed consideration within the air quality assessment is the potential impact of the construction phase, potentially resulting in dust nuisance at sensitive receptors. There are no statutory limits on acceptable levels of dust deposition and no nationally adopted assessment criteria for assessing the nuisance from the deposition of dust. Therefore the methodology for construction impact assessment will be agreed at a later date with the LPA.

4.1.1 Proposed Study Area

The spatial extent of the air quality assessment area cannot be determined until traffic data for the Scheme is available.

However, once this data is available, it is proposed that the Study Area is defined in line with the guidance contained in DMRB Volume 11, Section 3, Part 1 (HA207/07)[4]. It will comprise all land within 200m of the centre line of the existing road, land within 200m of the centre line of the improvement Scheme, and land within 200m of any other 'affected roads'.

Affected roads are identified in HA207/07 as follows:

- roads where the alignment will move by more than 5m;
- daily traffic flows will change by 1000 Annual Average Daily Traffic (AADT) or more;
- Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more;
- daily average speed will change by 10km/hour or more; or
- peak hour speed will change by 20km/hour or more.

The Study Area for the assessment of regional air quality will take into account all roads meeting the following criteria:

- a change of more than 10% in AADT;
- a change of more than 10% in the number of HDVs; or
- a change in daily average speed of more than 20km/hour.

4.2 Previous Studies and Baseline Information

4.2.1 Baseline Sources

At this early stage, baseline information, including Local Air Quality Management (LAQM) reports, air quality data and maps, has only been gathered from the following sources:

- Epping Forest District Council (EFDC);
- Harlow District Council (HDC);
- East Hertfordshire District Council (EHDC);
- Uttlesford District Council (UDC);
- Department of Food and Rural Affairs (Defra); and
- Multi Agency Geographic Information for the Countryside (MAGIC).

The desktop review of the current air quality information in the vicinity of the proposed Scheme and traffic model network included within this report covers a review of local authority reports, a review of the latest air quality monitoring, together with air quality background mapping produced by Defra.

[4] Highways Agency, DMRB, Volume 11, Section 3, Part 1, Air Quality, 2007

4.2.2 Epping Forest District Council

There is one Air Quality Management Area (AQMA) being declared for annual mean NO_2 concentration in Bell Vue, Epping in 2011. The 2015 Air Quality Updating and Screening Assessment report[5] indicated that there is no need to amend the boundaries of the current AQMA. The Bell Vue AQMA is approximately 1.2 km south-west to the proposed Scheme. Preliminary traffic information indicated that the proposed Scheme is unlikely to have an effect on air quality in this AQMA.

EFDC has no continuous monitoring station within Epping but currently monitor the NO_2 concentration at 22 locations across the district, using NO_2 diffusion tubes. Site ID 6 at Canes Cottages, Hastingwood (547838, 206819) is located 170m to the east of the M11 carriageway to the south-east of Harlow. The 2014 NO_2 annual mean concentration at this location was 26µg/m³, which is within the relevant AQO of 40µg/m³. The past five years (2010 – 2014) monitoring data indicate that a decrease trend in NO_2 concentration at this location (2010: 31 µg/m^3, 2011: 27 µg/m^3, 2012: 28 µg/m^3, 2013: 28 µg/m^3 and 2014: 26 µg/m^3). EFDC does not currently monitor for PM_{10}.

4.2.3 Harlow District Council

The 2015 Updating Review and Screening Assessment (USA) report[6] highlights that previous rounds of assessments have not required the designation of any AQMAs within the district. HDC do not operate an automatic monitoring station, but operate non-automatic monitoring of NO_2 using passive diffusion tubes at seven locations. The closest location to the proposed Scheme is HAR8 (546942, 211186), located on the A414, 2.1km to the south-west of Mayfield Farm. The USA report highlighted that the 2014 annual mean NO_2 concentration at HA8 was 28.2µg/m³, which is well within the AQO of 40µg/m³. The past five years (2010 – 2014) monitoring data indicate that a steady trend in NO_2 concentration at this location (2010: 30.7 µg/m^3, 2011: 29.9 µg/m^3, 2012: 31.4 µg/m^3, 2013: 27.7 µg/m^3 and 2014: 28.2 µg/m^3). HDC do not currently monitor PM_{10}.

4.2.4 East Hertfordshire District Council

The 2015 Updating and Screening Assessment report from EHDC[7] states that three AQMAs have been declared in the area, Bishops Stortford (Hockerhill junction) in 2007, Hertford (Gascoyne Way) in 2012 and Sawbridgeworth (London Road and Cambridge Road) in 2014. The Sawbridgeworth AQMA is approximately 2.7km north-west to the proposed Scheme. Preliminary traffic information indicated that the proposed Scheme is likely to have an effect on air quality in this AQMA.

EHDC operates two automatic monitoring stations within Sawbridgeworth. The monitoring data from these stations were 33µg/m^3 and 19µg/m^3 for annual mean NO_2 in 2014, which were below the AQO.

EHDC also operate a survey of 37 location diffusion tube across the area. Following a review of these locations, none are in close proximity to the proposed Scheme, but may be on roads affected by the Scheme.

4.2.5 Uttlesford District Council

The 2015 Updating and Screening Assessment report from UDC states that one AQMA has been declared for annual mean NO_2 at Saffron Walden. The AQMA lies approximately 25.6km north of the proposed Scheme. UDC operates three automatic monitoring stations north of the Scheme and the monitoring data from these stations were 22.9µg/m^3, 17.8µg/m^3 and 15.3µg/m^3 for annual mean NO_2.

UDC also operates a network of 27 diffusion tube sites across the area. Following a review of these locations, none are within close proximity to the proposed Scheme; however, they may be on affected roads by the Scheme. UDC measure PM_{10} at two continuous monitor stations with the annual mean concentrations recorded as 26.8µg/m^3 and 31.2µg/m^3. This is below the AQO.

[5] Epping Forest District Council, 2015 Updating and Screening Assessment for Epping Forest District Council, 2015
[6] Harlow District Council, 2015 Updating and Screening Assessment for Harlow District Council, 2015
[7] East Hertfordshire District Council, 2015 Updating and Screening Assessment for East Herts, 2015

4.2.6 Defra Background Maps

Modelled background mapped concentrations of NO_2 and PM_{10} (together with other pollutants) are produced and provided by Defra. The data for the residential areas near to the proposed Scheme, Sheering Road and M11, has been obtained and is shown in Table 4.2 below.

Table 4.2: Defra Background Map Data (Epping Forest) - Relevant AQOs

Background Map Square	Proximity to	2014 Annual Concentration (µg/m³)	
548500, 212500	Campions / Sheering Road	NO_2	18.2
		PM_{10}	18.6
549500, 212500	M11 'The Mores'	NO_2	24.5
		PM_{10}	21.9

The background mapping concentrations show that concentrations of both NO_2 and PM_{10} at the location of the proposed Scheme (in terms of potentially affected receptors) are well within the relevant AQOs, and generally depict good air quality.

4.2.7 Designated Areas

No Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs) or Special Areas of Conservation (SACs) are located within 200m of the Scheme. However there are eight designated sites (seven SSSI's, one SPA, one SAC and one Ramsar) within the 200m of the traffic model network. The closest designation is Sawbridgeworth Marsh SSSI, 3km to the north. These designated sites would be potentially affected by the Scheme.

4.3 Value of the Environmental Resources and Receptors

Air quality receptors are as defined in Defra LAQM.TG(09)[8] including houses, schools, hospitals, care homes and designated sites (SSSIs, SACs, SPAs and Ramsar sites). The majority of the Study Area consists of rural land and the receptors are likely to be the residential properties in the Campions residential area, and along the B183, as they will be sensitive to the changes in road traffic as a result of the Scheme. It is proposed that all receptors will be considered to be of equal value.

4.4 Proposed Scope of Assessment

It is recommended that the air quality assessment for the proposed Scheme is progressed to dispersion modelling. The results from this assessment will then determine if mitigation measures need to be considered.

The baseline air quality information highlights that there is currently some air quality monitoring locations available on the A1184 and in the centre of Harlow, which are within the modelled traffic network, and any of these with suitable data captures could be used for model verification.

[8] Defra, Local Air Quality Management: Technical Guidance LAQM.TG(09), 2009

4.5 Proposed Assessment Methodology

Once traffic data is available, it is proposed that it will be assessed against the DMRB HA07/07 criteria for affected roads to determine the extent of the air quality assessment area.

It is proposed that the assessment of the significance of potential air quality impacts will be made using the IAN 174/13, providing updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07)[9]

[9] Highways Agency, DMRB, Volume 11, Section 3, Part 1, Air Quality, 2007

5. Cultural Heritage

5.1 Introduction

An initial desk-based review of baseline information has been undertaken following the guidance provided in Volume 11, Section 3, Part 2, Cultural Heritage of DMRB (HA 208/07)[10], which divides Cultural Heritage into three sub-topics: Archaeological Remains, Historic Buildings and Historic Landscape.

5.1.1 Proposed Study Area

In line with HA208/07, a Study Area extending 300m in every direction from the Scheme was defined.

5.2 Previous Studies and Baseline Information

5.2.1 Baseline Sources

Baseline data has been gathered from the following sources:

- The National Heritage List for information on statutorily and other nationally designated assets (World Heritage Sites, Scheduled Monuments, Listed Buildings, Registered Historic Parks and Gardens, Registered Battlefields);
- Essex Historic Environment Record (EHER) for information on designated and undesignated assets, and historic landscape characterisation data;
- ECC website for information on Conservation Areas;
- Essex Record Office for documents, historic mapping and local history publications (for Harlow, Matching and Sheering) (visited on 7th August 2014);
- An Envirocheck report for historic Ordnance Survey mapping (August 2014); and
- A site inspection of the Study Area undertaken on 8th August 2014.

5.2.2 Existing and Baseline Knowledge

A total of 100 heritage assets have been identified within or close to the Study Area, comprising: 38 archaeological remains, 53 historic buildings, and nine Historic Landscape Types have been identified in or close to the Study Area. A further three Listed Buildings have been included for assessment due to their proximity to the Study Area. These assets are summarised in Table 5.1 below and shown in Appendix A. The value of the assets identified within the Study Area comprises:

- 4 High Value assets;
- 49 Medium Value assets;
- 24 Low Value assets; and
- 26 Negligible Value cultural heritage assets.

No World Heritage Sites or Registered Battlefields have been identified in the Study Area.

[10] Highways Agency, DMRB, Volume 11, Section 3, Part 2, Cultural Heritage, 2007

There is the potential for unknown archaeological remains to be present in the proposed Scheme footprint. The EHER data indicates the presence of archaeological activity in the Study Area.

Table 5.1: Heritage assets within the Study Area

Asset No	Asset Name	EHER no.	Designation	Value
2	Cropmarks South of Woodlands Farm	MEX15840	None	Medium
3	Cropmark East of Sheering Hall and West of M11	MEX13264	None	Medium
4	Stone Coffin and pottery	MEX13087	None	Medium
5	Sheering Hall Ringwork	MEX13081	None	Medium
6	Barn Approximately 10m north of Sheering Hall	MEX1009272	Grade II Listed Building	High
7	Barn Approximately 30m north-west of Sheering Hall	MEX1009273	Grade II Listed Building	High
8	Sheering Hall	MEX1009271	Grade II* Listed Building	High
9	Potter's Croft Field Name	MEX13088	None	Negligible
10	Neolithic Polished Axe	MEX40975	None	Low
11	Harlowbury Brickworks (site of)	MEX1037231	None	Negligible
12	Gilden Way Cropmarks	MEX1038592	None	Medium
13	Tudor Cottage	MEX1007149	Grade II Listed Building	Medium
14	Medieval Pottery Scatter	MEX40873	None	Low
15	Pump 20m south-west of Mayfield Farmhouse	MEX1009289	Grade II Listed Building	Medium
16	Moor Hall gravel pit (site of)	MEX13230	None	Medium
17	Moor Hall (site of)	MEX1037407	None	Medium
20	Iron Age arrowhead and core findspot	MEX13195	None	Low
21	Gilden Way Archaeological Evaluation	MEX1039898	None	Medium

Asset No	Asset Name	EHER no.	Designation	Value
22	The House (Gibberd Garden)	1001299	Grade II Registered Park or Garden	Medium
23	High House	1111685	Grade II Listed Building	Medium
24	House 20m north-west of St Stephen's Cottages	1337570	Grade II Listed Building	Medium
25	Flint Blades and Core (Pincey Brook)	MEX15842	None	Medium
26	95 Sheering Road	N/A	None	Low
27	Former gravel pit 1	N/A	None	Negligible
28	Former gravel pit 2	N/A	None	Negligible
29	Eaves	N/A	None	Low
30	Boat house (site of)	N/A	None	Negligible
31	Mayfield Farm	N/A	None	Low
32	Campions	N/A	None	Low
33	Ealing Bridge	N/A	None	Low
34	Engine House	N/A	None	Low
35	The Bothy	N/A	None	Low
36	St Stephens Cottages	N/A	None	Low
37	Guide Post	N/A	None	Negligible
38	Post Box	N/A	None	Negligible
39	Former gravel pit 3	MEX15840	None	Negligible
40	1 Park Hill	MEX1031904	Grade II Listed Building	Medium
41	Harlow Baptist Church	MEX1007043	Grade II Listed Building	Medium
42	Prehistoric ditches Mark Hall School	MEX1038885	None	Low
43	Roman pits Mark Hall School	MEX1038886	None	Low

Asset No	Asset Name	EHER no.	Designation	Value
44	Post medieval features Mark Hall School	MEX1038887	None	Negligible
45	Gate Lodge (115 East Park)	MEX1007032	Grade II Listed Building	Medium
46	Garden Wall to Fawbert and Barnards School	MEX1007068	Grade II Listed Building	Medium
47	Fawbert and Barnards School	MEX1007067	Grade II Listed Building	Medium
48	Harlow medieval and post-medieval town	MEX13199	None	Medium
49	Old Harlow Conservation Area	DEX22815	Conservation Area	Medium
50	Linear Features (not a Cursus) South of Gilden Way	MEX23745	None	Negligible
51	Signpost at Mulberry Green	MEX1038456	None	Negligible
52	The Green Man Public House and Hotel	MEX1007082	Grade II Listed Building	Medium
53	4 Old Road	MEX1007102	Grade II Listed Building	Medium
54	2 Old Road	MEX1007101	Grade II Listed Building	Medium
55	The Old Forge	MEX1007083	Grade II Listed Building	Medium
56	3, 5, 7 and 9 Mulberry Green	MEX1007079	Grade II Listed Building	Medium
57	Cotswold	MEX1007080	Grade II Listed Building	Medium
58	The Dormer Cottage (31 Mulberry Green)	MEX1007081	Grade II Listed Building	Medium
59	Bowl Barrow, 240m North of The Kennels (Harlow Mound)	MEX264; DEX2998	Scheduled Monument	High
60	Mulberry Green House and Stables	MEX1007084	Grade II* Listed Building	High
61	Former Depot Site, Mulberry Green	MEX1040142	None	Negligible

Asset No	Asset Name	EHER no.	Designation	Value
62	Multi-period site New Hall	MEX1038998	None	Low
63	Gateway to Hill House	MEX1007086	Grade II Listed Building	Medium
64	Hill House	MEX1007085	Grade II* Listed Building	High
65	Evaluation by trial trenching Mulberry Green House, post medieval features	MEX1038884	None	Negligible
66	Post-medieval features at Granary Cottage	MEX1040139	None	Negligible
67	Granary Cottage	MEX1007087	Grade II Listed Building	Medium
68	Wall extending for 11 bays, east of Number 30	MEX1007088	Grade II Listed Building	Medium
69	Features at New Pumping Station	MEX1042289	None	Negligible
70	Gilden Way Fieldwalking Finds	MEX40741	None	Low
71	Long Barn	MEX1007145	Grade II Listed Building	Medium
72	Findspot of chisel/knife	MEX1032164	None	Low
73	Findspot of Post Medieval Spoon	MEX1045632	None	Negligible
74	14 Newhall	MEX1007144	Grade II Listed Building	Medium
75	Newhall Moat	MEX13162	None	Low
76	Almshouses (13 and 15 Sheering Road)	MEX1007146	Grade II Listed Building	Medium
77	23 Sheering Road	MEX1007076	Grade II Listed Building	Medium
78	Millhurst	MEX1007147	Grade II Listed Building	Medium
79	Garden Wall of 70 feet and Gatepiers immediately south-east of Mill Hurst Fronting Road	MEX1007148	Grade II Listed Building	Medium

Asset No	Asset Name	EHER no.	Designation	Value
80	Post-medieval finds from Churchgate, Sheering Road	MEX40938	None	Negligible
81	2, 4 and 6 Churchgate Street	MEX1007013	Grade II Listed Building	Medium
82	The School	MEX1007014	Grade II Listed Building	Medium
83	Meadhams	MEX1007024	Grade II Listed Building	Medium
84	Parish Church of St Mary and St Hugh	MEX1007017; MEX13196	Grade II Listed Building	Medium
85	Churchgate Street Conservation Area	DEX22811	Conservation Area	Medium
86	Godsafe	MEX1007016	Grade II Listed Building	Medium
87	Roman and post-medieval features at 1 Churchgate Street	MEX1041074	None	Low
88	Stafford Almshouses	MEX1007019	Grade II Listed Building	Medium
89	Lychgate to Church of St Mary and St Hugh	MEX1007018	Grade II Listed Building	Medium
90	Harlow medieval and post-medieval town	MEX13199	None	Low
91	K6 Telephone Kiosk on Churchgate Street	MEX1007015	Grade II Listed Building	Medium
92	13 Churchgate Street	MEX1007025	Grade II Listed Building	Medium
93	15 Churchgate Street	MEX1007026	Grade II Listed Building	Medium
94	Post Office on Churchgate Street	MEX1007027	Grade II Listed Building	Medium
95	Cropmarks west of Hillingdon House	MEX13262	None	Low
96	21, 23 and 25 Churchgate Street	MEX1007028	Grade II Listed Building	Medium
97	Modern features at Mill Lane	MEX42095	None	Negligible

Asset No	Asset Name	EHER no.	Designation	Value
HLT1	20th Century Agriculture	N/A	None	Negligible
HLT2	19th and 20th Century Woodland Plantation	N/A	None	Negligible
HLT3	Built-up Areas	N/A	None	Negligible
HLT4	Enclosed Meadow Pasture	N/A	None	Negligible
HLT5	Pre 18th Century Enclosure	N/A	None	Medium
HLT6	Informal Parkland	N/A	None	Negligible
HLT7	20th Century Communications	N/A	None	Negligible
HLT8	Modern Horticulture	N/A	None	Negligible
HLT9	Historic Earthworks	N/A	None	Medium

5.3 Value of the Environmental Resources and Receptors

The National Planning Policy Framework (NPPF) defines significance as 'the value of a heritage asset to this and future generations because of its heritage interest'. This significance could be related to archaeological, architectural and artistic or historic elements, and could also derive from the setting of the site [11]. HA208/07 provides a methodology for the assessment of the value of heritage assets, including historic buildings and conservation areas, and use of this methodology therefore aligns with the guidance provided by the NPPF. The term 'value' is used in order to avoid confusion with the terminology for impact assessment, and particularly 'significance of impact' as commonly used in EIA.

The criteria for the value of each heritage receptor (or asset) will be developed further during the EIA process in accordance with HA208/07 and based on baseline information and professional judgement.

5.4 Proposed Scope of Assessment

A detailed assessment, as defined by HA 208/07, is recommended for the Archaeological Remains sub-topic. Based on the guidance provided by HA 208/07 for archaeological remains, the Study Area for the Environmental Statement (ES) will be defined as the footprint of the proposed road and a 200m buffer around it. This Study Area will also be adopted for the historic buildings and historic landscape sub-topic.

The detailed assessment for archaeological remains will comprise the following tasks:

- Inspection of aerial photographs held by the Historic England Archive;
- Updated search of data held by the EHER;
- Inspection of sources held by the Essex Record Office including historic Ordnance Survey and pre-Ordnance Survey mapping, and local and regional cultural heritage literature; and

[11] Department for Communities and Local Government, National Planning Policy Framework, 2012

- A walkover survey to determine the impact of the proposed Scheme on archaeological remains.

Archaeological evaluation in the form of a geophysical survey of all accessible areas of the Scheme footprint has been commissioned to inform future environmental studies. This will enable a determination to be made of the presence or absence of buried archaeological remains, their character and extent. The results of the survey will be used to inform assessments of the value of heritage assets and of the magnitude of impact on them from the Scheme.

For the Historic Buildings and Historic Landscape sub-topics, simple assessments will be undertaken as defined in HA 208/07. Both assessments will use a range of desk-based sources, supplemented by field observations to inform the assessment of the value of heritage assets, the assessment of potential impacts resulting from the Scheme, and the recommendation of mitigation measures. For these assessments the following sources will be consulted:

- Updated search of data held by the EHER;
- Inspection of sources held by the Essex Record Office including historic Ordnance Survey and pre-Ordnance Survey mapping, and local and regional cultural heritage literature; and
- A walkover survey to determine the impact of the proposed Scheme on archaeological remains.

A single ES chapter covering all three sub-topics will be produced.

5.5 Proposed Assessment Methodology

Based on the guidance provided by HA 208/07 the Study Area for the Cultural Heritage chapter of the ES will be defined as the footprint of the proposed Scheme and a 200m buffer extending from it in all directions.

Assessment of the magnitude and significance of impact will be undertaken based on the guidance provided by HA208/07. Assessment of the setting of cultural heritage assets, including its contribution to their historic legibility and capacity for change will be undertaken based on the guidance contained in *Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets*[12] and *Seeing the History in the View: A Method for Assessing Heritage Significance within Views*[13].

Cultural heritage inputs to the ES will be prepared in line with the Chartered Institute for Archaeologists' *Code of Conduct*[14] and *Standard and Guidance for Historic Environment Desk-Based Assessment*[15] .

Consultation will be undertaken with Historic England, the archaeological advisors to ECC and the Conservation Officer.

[12] Historic England, Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets, 2015
[13] English Heritage, Seeing the History in the View: A Method for Assessing Heritage Significance within Views, 2011
[14] Chartered Institute of Archaeologists, Code of Conduct, 2014
[15] Chartered Institute of Archaeologists, Guidance for Historic Environment Desk-Based Assessment, 2014

6. Landscape and Visual

6.1 Introduction

It is proposed that the landscape and visual impact assessment is carried out with reference to DMRB Volume 11 Sections 2-3, and the Guidelines for Landscape and Visual Impact Assessment (GLVIA) Third Edition 2013[16], published by the Landscape Institute and the Institute of Environmental Management and Assessment (IEMA).

6.1.1 Proposed Study Area

The proposed Study Area is shown on the environmental constraints plan in Appendix A.

6.2 Previous Studies and Baseline Information

6.2.1 Baseline Sources

This baseline information is derived from surveys of the site, and from desk-based study of county and local planning authority web sites and other environmental mapping sites. Information on tree preservation orders (TPOs) was obtained by correspondence with the planning department at Epping Forest District Council. Landscape surveys of the Study Area were carried out in November 2013, October 2014 and April and September 2015. The 2014 survey was conducted along the line of the proposed route; the other surveys were from Public Rights of Way (PRoW).

6.2.2 Landscape Character

The Study Area falls within the national landscape character zone of the South Suffolk and North Essex claylands. At regional level, Essex Landscape Character Assessment[17] describes most of this area as glacial till plateau forming part of the Central Essex Farmlands. The Stort Valley character area includes the land either side of the Pincey Brook west of the M11. Urban areas predominate to the south-west, in Harlow.

Epping Forest District Council's (EFDC) landscape assessment (2010)[18] divides the Essex Farmlands area along the course of Pincey Brook, with Sheering, to the north and Matching to the south. There is little difference between these zones. Both are described as elevated gently rolling and mainly arable landscapes with small river valleys. Fields are medium to large-scale, often enclosed by hedges. Winding lanes and minor roads connect dispersed settlements. The proposed Study Area includes several deciduous woodlands. Former estate lands belonging to Moor Hall (demolished 1960) include an entrance lodge, stables, two ponds, and remnant belts of trees. There are long distance views across valleys. There is no tranquillity near the M11 and Harlow, or near busy traffic on the B183 Sheering Road, but tranquillity increases with distance from these roads.

The River Stort area is gently sinuous with a sense of enclosure from vegetation along the river corridor. There is a patchwork of pasture and wetland and a network of rural roads. Large residential properties nearby include the 18thC Durrington Hall with associated park and Sheering Hall (15th-16th Century). Views are focused along the river corridor. Away from major transport corridors the area has a strong sense of tranquillity.

Two sites near the proposed Scheme are designated in the EFDC Local Plan as Local Wildlife Sites (LWS).

[16] IEMA, Guidelines for Landscape and Visual Impact Assessment (GLVIA) Third Edition, May 2013
[17] Chris Blandford Associates, Essex Landscape Character Assessment, 2003
[18] Chris Blandford Associates, Epping Forest Landscape Studies – Landscape Character Assessment, 2010

- Pincey Brook Meadows LWS – along Pincey Brook, west of Sheering Road, contains Hornbeam and Ash woodland in parts of this area. The key quality feature are a series of grasslands and wetland vegetation either side of Pincey Brook; and

- Moorhall Wood LWS – east of the M11 is ancient woodland dominated by Hornbeam coppice with occasional Sycamore coppice and Ash standards. There is a cluster of Small-leaved Lime coppice stools in the north-west corner. The shrub layer is varied and the ground flora is dominated by Dog's Mercury with concentrations of Bluebells.

There are TPOs protecting blocks of woodland, shelter belts and pond-side trees on land that belonged to the former Moor Hall Estate. They are numbered W1, 2, 3 etc. on the environmental constraints plan (Appendix A).

Gibberd Garden is located at the home of the late Frederic Gibberd (designer of Harlow new town) and is on the list of Registered Parks and Gardens. The property has an extensive sculpture garden, arboretum and tearoom. This is located just outside the proposed Study Area; however, it is accessed by the public via Marsh Lane off Gilden Way. Listed buildings are described in Cultural Heritage Chapter of this report.

6.2.3 Landscape Features

The normally slow moving Pincey Brook passes under the M11 and takes a sinuous course through the proposed Study Area with a bend around Sheering Hall. It passes through meadows with a pond west of Sheering Road, and continues through the Gibberd Garden and under the railway to join the River Stort. It supports a wide variety of native trees, shrubs and wetland plants. It is a locally attractive feature and an important component of the landscape character of the area.

The gentle valley slopes either side of Pincey Brook consist of medium to large size arable fields and mature woodland and tree belts of the former Moore Hall Estate. Sheering Road, north of Mayfield Farm, is enclosed with mature trees and shrubs on the east side and by brick garden walls, shrubs, hedges and trees in the residential properties on the west side. The cuttings and embankments of the M11 are clothed with dense blocks of young trees and shrubs in some sections but there are also some more open sections with intermittent trees, shrubs, long grass and bramble.

The proposed Scheme extends into Harlow along Gilden Way and First Avenue Mandela Way. Harlow new town was developed in 1947 as a satellite town outside the London Green Belt. It was built southwest of Old Harlow with a generous network of green spaces retaining existing woodlands. Gilden Way was built in the mid-1960s bypassing to the south of Old Harlow and superseding Sheering Road which was the original winding route into Old Harlow from the northeast. The superseded portion remains as a quiet backwater with older houses and mature trees. Gilden Way passes close to and crosses part of this older residential zone screened with roadside hedges and tree belts, but fields border significant stretches of the road. Housing developments with planning permission (some currently under construction) will soon fill these fields so that Gilden Way will be enclosed by suburban development and recreational open spaces.

6.2.4 Visual amenity and receptors

It is proposed that key receptors for the assessment of visual amenity will be residential and non-residential properties with views of the proposed Scheme and people utilising public rights of way with views of the Scheme. The evaluation of the sensitivity of receptors for visual amenity will follow DMRB methodology.

6.3 Value of the Environmental Resources and Receptors

It is proposed to utilise the values assigned by EFDC where relevant. Central Essex Farmlands Character Area (Sheering) is described by EFDC as having a low to moderate level of sensitivity to development. In Central Essex Farmlands Character Area (Matching) it is assessed as moderate.

Moderate sensitivity can be taken as equivalent to the Medium level used in DMRB terminology. EFDC also state that the open skyline of higher areas is sensitive to new development that could be located within views across, toward and from the area. EFDC rate the sensitivity to development of the River Stort Character Area as low to moderate (Medium).

The proposed Study Area has attractive undulating countryside with woodlands and the Pincey Brook. The area is not disfigured by pylons or other eyesores, and there are no landscape features of nationally or regionally high importance or rarity. Although the M11 is quite well screened, it has a detracting effect on local landscape character.

6.4 Proposed Scope of Assessment

The features and character of the existing landscape and views will be described and their value / sensitivity will be assessed. The magnitude of temporary and permanent effects of the proposed Scheme on landscape and views from private properties and publicly accessible areas will be described. The significance of those effects will be assessed taking into account the sensitivity of the affected landscape or viewpoint and the proposed landscape mitigation measures over time. The residual landscape and visual effects after mitigation and the cumulative effects of the Scheme as a whole will be summarised, taking into account any related or concurrent development proposals in the assessment area.

6.5 Proposed Assessment Methodology

It is proposed that the assessment will follow the guidance on landscape and visual impact assessment contained in IAN 135/10[19], and the GLVIA Third Edition, published by the Landscape Institute and IEMA (2013).

[19] Highways Agency, Landscape and Visual Effects Assessment, November 2010

7. Ecology and Nature Conservation

7.1 Introduction

This Chapter considers ecology and nature conservation and the potential species, habitats and designated sites that could potentially be affected by the Scheme.

An extended Phase 1 habitat survey was conducted in August 2013, based on the Scheme design at that time, which formed the basis of the recommendations for further survey work. Ecological surveys (badgers, bat roost assessments and great crested newt (GCN) Habitat Suitability Index (HSI) surveys) were undertaken over the winter period 2013-14. Protected species surveys continued in 2014 and 2015 for bats, GCN, riparian mammals, reptiles and badger.

The addition of the Gilden Way widening proposals to the Scheme in late 2015 triggered the need for further ecological surveys to assess potential impacts at this location. An extended Phase 1 habitat survey was undertaken along the publicly accessible margins of Gilden Way in September 2015, allowing the identification of further species-specific survey work that would be required. To date, the need for further surveys for bats, GCN, riparian mammals, badgers, reptiles and habitats (e.g. Gilden Way Roundabout Protected Wildlife Verge and Important Hedgerows) has been identified. Some preliminary work (pond and tree assessments and badger and hedgerow surveys) can be undertaken over the 2015 / 2016 winter period, with presence / absence or activity surveys (for bats, GCN and riparian mammals) and habitat surveys (Gilden Way Roundabout Protected Wildlife Verge) programmed for spring / summer 2016.

The Scheme has evolved over the last few years, with multiple options being considered and surveys undertaken in stages. To aid explanations in the subsequent sections of this Chapter, the Scheme will be described as two separate sections: 'the Main Site', referring to the area between Sheering Road and the M11 subject to proposals for the new junctions and slip road; and, 'Gilden Way', referring to the section of Gilden Way subject to widening proposals.

7.1.1 Development Footprints and Proposed Study Area

Originally several route options were under consideration and a composite footprint was drawn up for the Main Site that covered a sufficiently large area to accommodate all potential routes. As the Scheme evolved during 2015, the route became fixed and consequently the footprint contracted. Therefore, during the design and programming of 2015 ecological surveys, where impacts were assessed as unlikely to occur on habitats due to the standoff from the footprint, some habitats were scoped out. Rationales for scoping in and out ecological surveys / habitats are presented in the subsequent sections.

Ahead of detailed proposal plans emerging, it is assumed that the working width either side of the Gilden Way carriageway will be 10m, and this is taken as the footprint.

The development footprint for the Main Site and for Gilden Way, together make up the Scheme.

Due to the varied ecology and sensitives of ecological receptors potentially affected by the Scheme, a number of Study Areas were adopted. These are described below:

- 30km buffer from the Scheme for SACs designated specifically for bats;
- 2km buffer from the Scheme for all other Natura 2000 sites, National Nature Reserves, Local Nature Reserves, SSSI and Ancient and Semi-Natural Woodland (ASNW);
- 1km buffer from the Scheme for locally designated sites (LWS and Protected Wildlife Verges) and protected species records;

- 500m buffer from the Scheme for waterbodies with potential for GCN (*Triturus cristatus)*;
- 250m buffer from the Scheme for watercourses with potential for otter (*Lutra lutra)* and water vole (*Arvicola amphibious)*;
- 100m buffer from the Scheme for potential bat roosts;
- 50m buffer from the Scheme for badger (*Meles meles)* setts; and
- Within the Scheme / development footprint for all receptors.

7.2 Previous Studies and Baseline Information

7.2.1 Baseline Sources

Ecological records were obtained from Essex Ecology Services Limited (EECOS), part of Essex Wildlife Trust, and Essex Field Club (EFC) in 2013 in relation to the Main Site. In 2015 additional records were obtained from these data repositories to inform the Gilden Way widening proposals.

The MAGIC website was used to locate designated sites potentially affected by the Scheme, and Ordnance Survey maps were examined to locate key habitats such as waterbodies within 500m.

7.2.2 Designated Sites

There are no SACs designated for bats within 30km of the Scheme. There are no Natura 2000 Sites, National Nature Reserves, Local Nature Reserves or SSSIs within 2km of the Scheme.

There are four blocks of ASNW within 2km of the Scheme. To the south of Gilden Way are Markhall Wood and Barnsley / Brenthall Woods, and to the north of the Main Site is Marsh Lane Wood, with Heathen Wood and Matching Park to the east of the M11.

At the time of writing full details of all LWSs within 1km of the Scheme have not been received from the biological data providers, however a search of the interactive Local Plan Map[20] has identified the following LWSs within 1km of the Scheme:

- NE18/25 Markhall Wood;
- NE18/28 Gravelpit Spring, New Hall Farm;
- NE18/22 New Pond Spring;
- NE18/21 Gilden Way Meadow;
- NE18/5 Harlow Common; and
- NE18/17 Pincey Book Meadows.

Within Harlow there is also another tier of locally designated sites called Protected Wildlife Verges (PWV). The Gilden Way Roundabout is described within the Adopted Replacement Harlow Local Plan (2006) as a PWV. However, Harlow Council does not have a detailed account of the special interest of the site or designation criteria for PWVs.

[20] Harlow Council, Interactive Local Plan Map, http://www.cartogold.co.uk/Harlow/harlow.htm [Accessed 12/11/2015]

7.2.3 Protected and Notable Species Records

In 2013, EECOS provided 19 GCN records, one otter record, one water vole and nine badger records within 1km of the Main Site Study Area boundary. One record for small heath (*Coenonympha pamphilus*), a UK Biodiversity Action Plan (UK BAP) species of butterfly, was also returned.

In 2013, EFC provided 109 records for European and nationally protected species within 1km of the Main Site Study Area. These included 21 bats records, six GCN records and 10 badger records, none of which were located within the Study Area boundary. The EFC did not hold any records for birds at that time.

EFC also provided 23 Natural Environment and Rural Communities Act (2006) S41 / UK BAP Priority Species records, 30 records of species on the Global and National Red List and Scarce Species and 61 records of species on the Essex Red Data List. This included one record of unbranched bur-reed (*Sparganium emersum*) located along the Pincey Brook and records for 10 invasive species.

One record for Himalayan Balsam (*Impatiens glandulifera*) was found to be located within the Main Site Study Area on the Pincey Brook.

In 2015 EFC provided a large number of records of European and nationally protected species from within 2km of the Gilden Way Study Area including 88 records of bats, eight GCN records, one otter record, two water vole records and 15 badger records.

EFC also provided 112 records of NERC S41 / UKBAP species, 14 records of nationally Rare or Scarce species and 241 records of species listed on the Essex Red Data List.

At the time of writing no records have been received from EECOS in relation to the 2015 request.

7.2.4 Extended Phase 1 Habitat Survey – General Habitat Description

<u>Main Site</u>

The Main Site Study Area is predominantly agricultural landscape dominated by large fields supporting arable crops. The arable fields are bordered by hedgerows / tree lines or areas of broadleaved plantation woodland. To the west of Sheering Road and adjacent to the southern bank of Pincey Brook is an area of semi-improved grassland, currently used for horse grazing.

The Study Area includes several blocks of broadleaved woodland including the Mores Woodland located centrally; Woodland 2, a wide strip of mature broadleaved plantation woodland located adjacent to the southern carriageway of the B183 Sheering; and, Woodland 3, located to the west of Mayfield Farm, adjacent to Gilden Way. The steep embankments of the M11 motorway have also been planted with a variety of species of tree.

Within the Study Area, there are several water bodies including ponds and a large lake. Pincey Brook is located in the northern part of the Study Area, running through largely agricultural land. The brook is bordered to the north and south by dense, species-rich broadleaved riparian woodland.

A low, well-managed hedgerow with four mature pedunculate oak *(Quercus robur)* trees extends in an easterly direction from Woodland 2 into the adjacent agricultural land.

Gilden Way

Gilden Way is a two-lane carriageway with amenity grass verges and a pedestrian footway along the majority of its length. The road passes through arable farmland to the east and into more urbanised and residential areas to the west.

Adjacent habitats include amenity and semi-improved grassland, small blocks of broadleaved and coniferous plantation and semi-natural broadleaved woodland, scattered trees, residential gardens containing mature trees, species-rich and species-poor hedgerows, a stream corridor and a large area subject to soil stripping in preparation for development (Newhall Farm).

7.2.5 Protected Species Overview

The extended Phase 1 habitat surveys indicated that there are habitats present within the Main Site and Gilden Way Study Areas with potential to support badgers, dormice *(Muscardinus avellanarius)*, bats, reptiles, breeding birds, GCN and riparian mammals.

The following surveys have been undertaken to date, with reference to best practice guidelines:

- Breeding Birds - Breeding bird surveys were undertaken primarily within large arable fields or semi-improved grassland, with areas of broadleaved woodland, broadleaved plantation woodland along motorway embankments, mature hedgerows and running water (Pincey Brook);

- Bats - All potential roosts and foraging and commuting pathways within the Main Site Study Area were initially surveyed in 2014. Static monitoring of potential crossing points on the M11 and Sheering Road and 'back tracking' surveys to search for potential roosting sites within a woodland block were also undertaken in 2014. In 2015, further roost surveys were undertaken, and static detectors deployed on potential flight lines within the Main Site Study Area. With regard to the Gilden Way Study Area, roost surveys are planned for winter 2015 / 2016 (ground-based and climbing inspections of trees) and activity surveys (emergence / re-entry and crossing point surveys) are planned for the active survey season in 2016;

- Dormice – All potentially affected, suitable habitats within the Main Site Study Area were surveyed, with the results indicating the likely absence of this species. Due to the urbanised nature of the environment around Gilden Way (and assumed increase in cat predation), lack of biological records, and lack of records form the Main Site (following intensive survey), the need for dormouse surveys was scoped out for the Gilden Way Study Area;

- Riparian mammals –The Pincey Brook (Main Site Study Area) was subject to water vole and otter surveys in 2014. No evidence of water vole was recorded, but otter presence was established. In addition, an American signal crayfish (*Pacifastacus leniusculus*) was incidentally recorded within the Pincey Brook. Riparian mammal surveys are planned for the tributary to the River Stort which passes beneath Gilden Way in 2016;

- GCN – An HSI assessment of waterbodies located within 500m of the Main Site Study Area was undertaken between March and November 2014 where access was permitted. Presence / absence surveys were conducted in 2015 on those ponds for which access could be arranged. No GCN were recorded, although not all ponds could be accessed. HSI assessments and presence / absence surveys are planned for waterbodies within 500m of the Gilden Way Study Area in 2015 - 2016;

- Reptiles – All potentially affected, suitable habitat within the Main Site Study Area was surveyed in 2014, establishing presence of grass snake (*Natrix natrix*) and common lizard (*Zootoca vivipara*). Surveys of potentially affected, suitable habitat within the Gilden Way Study Area are planned for 2016; and

- Badgers - All potentially affected, suitable habitat for badgers within the Main Site Study Area were surveyed in 2014 and 2015, establishing the presence of this species. Badger surveys of suitable habitats within the Gilden Way Study Area are planned for 2016.

A summary of the results of these surveys are included below. Full results will be presented within the ES which will be submitted with the planning application.

7.2.6 Breeding Birds

A total of 43 species of bird were recorded during the 2014 breeding bird surveys within the Main Site Study Area. No species listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were recorded, although Barn Owl (*Tyto alba)* were incidentally recorded flying within the site during bat surveys.

7.2.7 Bats

During the 2014 roost surveys of habitats within the Main Site footprint, common pipistrelle (*Pipistrellus pipistrellus*) bats were recorded roosting within Mayfield Farm Barn and a bat tree-roost, considered likely to be long-eared bat (*Plecotus* sp.), was recorded within The Mores Woodland during the tree-climbing inspection.

The results of the transect activity surveys, woodland backtracking assessment and static monitoring surveys conducted within the Main Site Study Area in 2014, confirmed the presence of long-eared (*Plecotus* sp.*)*, common pipistrelle, soprano pipistrelle (*Pipistrellus pygmaeus)*, *Myotis* bats (*Myotis sp.)*, noctule (*Nyctalus noctula)* and other 'big' bats (bats with call parameters indeterminate between *Nyctalus* and *Serotinus* bats).

Emergence / re-entry surveys undertaken in 2015 within the Main Site Study Area did not record any further tree roosts but, in addition to those species recorded within the site in 2014, static detector surveys also identified occasional passes by Nathusius' pipistrelle (*Pipistrellus nathusii)* and barbastelle bats (*Barbastellus barbastellus*).

The 2015 surveys indicate that key flight lines within the Main Site Study Area are the treeline along Sheering Road, Pincey Brook and the treelines / wooded areas leading east and south from Moorhall Wood.

7.2.8 Dormice

During the 2014 roost surveys of habitats within the Main Site footprint, common pipistrelle (*Pipistrellus pipistrellus*) bats were recorded roosting within Mayfield Farm Barn and a bat tree-roost, considered likely to be long-eared bat (*Plecotus* sp.), was recorded within The Mores Woodland during the tree-climbing inspection.

The results of the transect activity surveys, woodland backtracking assessment and static monitoring surveys conducted within the Main Site Study Area in 2014, confirmed the presence of long-eared (*Plecotus* sp.*)*, common pipistrelle, soprano pipistrelle (*Pipistrellus pygmaeus)*, *Myotis* bats (*Myotis sp.)*, noctule (*Nyctalus noctula)* and other 'big' bats (bats with call parameters indeterminate between *Nyctalus* and *Serotinus* bats).

Emergence / re-entry surveys undertaken in 2015 within the Main Site Study Area did not record any further tree roosts but, in addition to those species recorded within the site in 2014, static detector surveys also identified occasional passes by Nathusius' pipistrelle (*Pipistrellus nathusii)* and barbastelle bats (*Barbastellus barbastellus*).

The 2015 surveys indicate that key flight lines within the Main Site Study Area are the treeline along Sheering Road, Pincey Brook and the treelines / wooded areas leading east and south from Moorhall Wood.

7.2.9 Riparian Mammals

With regard to the Main Site Study Area, one fresh otter spraint was found on a rock within the Pincey Brook located to the west of the bridge at Sheering Hall. No otter holts were recorded during the survey. No evidence of water vole activity was recorded along the Pincey Brook. It should be noted that the survey was constrained (access and number of visits) and consequently water vole absence (and the absence of otter holts) should not be assumed for this watercourse.

There are other waterbodies within the Main Site Study Area with potential to support water vole and otter (two large ponds and a lake); however these habitats were considered unlikely to be affected by the Scheme and so were scoped out of the need for survey.

With regard to the Gilden Way Study Area, surveys for otter and water vole are planned for 2016 along the watercourse crossed by Gilden Way. There is a record dating from 2010 of water vole and otter at this location.

7.2.10 Great Crested Newts

There are 16 ponds and one lake located within, or just beyond, the 500m buffer for the Main Site Study Area. HSI surveys were undertaken of these waterbodies and some were found to be unsuitable or isolated from the Study Area and were subsequently scoped out of the need for further survey. As the Scheme design evolved in 2015, further ponds (located more than 500m from the proposed route) were also scoped out.

Attempts were made in early 2015 to gain access to the remaining ponds to undertake GCN presence / absence surveys. Access could not be arranged for all ponds; however, GCN surveys were successfully undertaken on those ponds where access permission was granted. No GCN were recorded.

7.2.11 Reptiles

There are 16 ponds and one lake located within, or just beyond, the 500m buffer for the Main Site Study Area. HSI surveys were undertaken of these waterbodies and some were found to be unsuitable or isolated from the Study Area and were subsequently scoped out of the need for further survey. As the Scheme design evolved in 2015, further ponds (located more than 500m from the proposed route) were also scoped out.

Attempts were made in early 2015 to gain access to the remaining ponds to undertake GCN presence / absence surveys. Access could not be arranged for all ponds; however, GCN surveys were successfully undertaken on those ponds where access permission was granted. No GCN were recorded.

7.2.12 Badgers

During the 2014 surveys of the Main Site Study Area 16 badger setts and three possible badger setts were recorded. Three were categorised as main setts.

The Main Site Study Area was re-surveyed in July 2015. Badger activity was much reduced with only scant evidence of badgers recorded. However, surveyors deploying static bat detectors later in the season, observed that the main sett previously recorded in The Mores woodland, had come back into use with evidence of high levels of activity such as trampled vegetation near to setts and large fresh spoil heaps outside sett entrances.

With regard to the Gilden Way Study Area, surveys for badgers are planned for 2015 - 2016.

7.3 Value of the Environmental Resources and Receptors

It is proposed that the methodology set out in the document *Guidelines for Ecological Impact Assessment in the United Kingdom*[21] is used to initially evaluate the value of the ecological resources and receptors. At the time of writing, the overall value of the Study Area is considered to be Low-Medium but this will be assessed in further detail in the final ES.

7.4 Proposed Scope of Assessment

The scope of the assessment has been determined using baseline data, the results of the extended Phase 1 habitat surveys and the detailed protected species surveys. The assessment will consider the following ecological receptors:

- Habitats listed under Section 41 of the Natural Environment and Rural Communities Act 2006;
- Ancient and semi-natural woodland;
- Locally designated sites;
- Breeding birds and bird nesting habitat;
- Bats and bat roosts;
- Otters and otter holts;
- Water voles and burrows;
- GCN and breeding habitat;
- Badgers and setts; and
- Reptiles.

To ensure that the ecological assessment is based on a robust set of data, further surveys for protected species and habitats are planned for 2016.

7.5 Proposed Assessment Methodology

It is proposed that the ecological assessment be undertaken using guidance from the *Guidelines for Ecological Impact Assessment in the United Kingdom* and the Highways Agency's IAN Ecology and Nature Conservation: Criteria for Impact Assessment (IAN 130/10). Both are relevant to this assessment. The guidance includes illustrative criteria for use in the assessment, which can be adapted based on professional judgement.

It is considered that the Scheme offers many opportunities for biodiversity enhancements, in particular the reinforcement and creation of new habitat linkages through native planting schemes along the proposed carriageway embankments, strategic siting of woodland creation to compensate for small areas lost, linking and reinforcing existing woodland stands, and the creation of wetland and marginal areas through careful design of attenuation ponds.

[21] Chartered Institute of Ecology and Environmental Management, Guidelines for Ecological Impact Assessment in the United Kingdom, 2006

8. Geology and Soils

8.1 Introduction

This Chapter considers potential land contamination constraints in relation to the Scheme. Highways projects can have significant effects on geology and soils. The characteristics of the underlying ground conditions can also be key constraints on the design of a new road.

Geology and soils are known to be key factors in determining the quality and environmental character of an area. Their properties can determine the flood risk, water storage capacity, agricultural quality and the type and variety of vegetation of an area.

The information presented in this report is in accordance with the best practice guidance presented within Environment Agency Contaminated Land report[22].

8.1.1 Proposed Study Area

The Study Area for this assessment is defined as the route of the proposed Scheme and the area in the vicinity of the route that could be impacted by ground conditions along the route or which could impact the route itself. For the purpose of this assessment this is generally considered to be approximately 250m on either side of the route, however this may be increased or decreased depending on the potential magnitude of impact.

8.2 Previous Studies and Baseline Information

8.2.1 Baseline Sources

Baseline data was gathered from the following sources:

- Historical land use has been assessed by review of historical Ordnance Survey mapping using an Envirocheck report from Landmark[23];
- The geological setting of the Study Area has been assessed with reference to the British Geological Survey (BGS) website[24];
- The Environment Agency website[25]; and
- Correspondence from Harlow Council[26].

8.2.2 History of the Proposed Study Area and Surrounding Land – Potential Contaminative Land

The historical land use on site can be summarised as follows:

- The proposed new road section has comprised agricultural / undeveloped land since at least 1975-1881;
- For the Gilden Way link road section there has been no significant change until the Gilden Way was built (present on maps from 1965);
- Between 1898 and 1923 Mayfield Farm was developed to the south east of Sheering Road; and

[22] Environment Agency, Contaminated Land report 11: Model Procedures for the Management of Land Contamination, 2004
[23] Landmark Information Group, Envirocheck report: BGS Boreholes Datasheet, August 2013
[24] British Geological Survey (BGS), Geology of Britain viewer, http://mapapps.bgs.ac.uk/geologyofbritain/home.html [Accessed 14-12-2015]
[25] Environment Agency website "What's in Yours Backyard"- http://apps.environment-agency.gov.uk/wiyby/ [Accessed 14-12-2015]
[26] Correspondence from Harlow Council

- In the M11 Junction 7A section no significant changes were recorded until 1960-1982 when the M11 was built.

The historical land use offsite within 250m of the Scheme can be summarised as follows:

- The land surrounding the proposed Scheme has predominantly been agricultural / undeveloped land between approximately 1975-1881;
- Between 1881 and 1887 gravel and clay pits and a brickfield are shown to the north and south of the proposed M11 Junction 7A route. These are no longer shown by 1982 and appear to have been infilled;
- Between 1887 and 1889 there is increased residential development, with a number of gravel pits present on the maps and a fire station house to the north of the Gilden Way.
- In 1923 there is some additional development, with Mayfield Farm and some allotments (parallel to the Gilden Way link road route, near to Harlow) present on maps from this date.
- Between 1947 and 1982 housing developments have expanded and redeveloped to the north and south of the proposed M11 Junction 7A route;
- In the area of the proposed Gilden Way link road route, there is no significant change until 1960, when there is some increased development in Harlow, with an electrical substation present (1965-1986 map).
- In 1982, Harlow (now labelled as 'Old Harlow') and the Churchgate area to the north of the Gilden Way are further developed, with the Fire station house now labelled as F House and Ambulance station and the gravel pits no longer present (potentially infilled); and
- From 1982 the land within the proposed Study Area remains largely unchanged with the exception of the addition of Morgan farm (250m to the south of the proposed M11 Junction 7A route) and another farm in 2013 (next to Sheering Hall).

Contemporary Trade Directory Entries and Fuel Station Entries obtained from the Landmark Envirocheck reports are summarised below.

- At the eastern end of Gilden Way there is: one active polythene and plastic sheeting supplier, an active sausage manufacturer and an inactive furniture manufacturer, inactive meat wholesaler and inactive cheese supplier.
- On Oxleys Road (connects to the middle of Gilden Way) there is an active road haulage services;
- At Mulberry Green (connects to the middle of Gilden Way) there is an inactive slate products company; and
- There are no fuel station entries within 500m.

8.2.3 Local Authority and Regulatory Correspondence

The Contaminated Land Officer of ECC, Harlow Council and Epping Forest District Council were contacted on 30 October 2015 to enquire whether the Councils hold information relevant to the Gilden Way Study Area relating to:

- Contaminated land issues / designations;
- Historical land uses / general knowledge of the area;

- Pollution incidents;
- Water abstractions;
- Ground gas and aggressive ground issues;
- Historical and recorded landfills and other waste management facilities;
- Environmentally sensitive sites; and
- Any other issues relevant to the environmental setting.

The responses are currently outstanding from ECC and Epping Forest District Council so cannot be considered in this assessment.

A response has been received from Harlow Council. The information received from Harlow Council states that the current land use is agricultural and there are no known contaminated land issues/ designations, or pollution incidents within the Study Area. There are also no water abstractions for human consumption within the Study Area. In relation to ground gas and aggressive ground issues Harlow Council state that gas monitoring and sampling points existed during a 2006 survey in the field to the north of and within 250m of Gilden Way. In regard to historical and recorded landfills and other waste management facilities, Harlow Council provided information recording that there is a pit left after gravel extraction shown on a 1951 map, in the field to the north of and within 250m of Gilden Way. This has since been infilled “presumably with domestic refuse”. Harlow Council state that further information may be available from ECC. There is an environmentally sensitive site in Gibberd Gardens which is just over 250m distance from Gilden Way and is a designated Third Tier Wildlife site. No other issues relevant to the environmental setting were specified. The full response from Harlow Council is presented in Appendix B.

8.2.4 Ground Gases

Waste management facilities may represent potential sources of ground gases. The nearest recorded historical landfill is the Moor Hall Road landfill, which is located to the south of the Study Area and accepted inert waste between 1974 and 1976.

In addition there is one licensed waste management facility within the proposed Study Area (near Mulberry Gardens to the north of Gilden Way). This is for the management of composting waste (only accepting organic materials suitable for composting). The licence status for this site is currently dormant.

There are a number of old mineral extractions sites. These are all located close to the very eastern end of Gilden Way and were all for the extraction of sand and gravel. This type of mining was open cast so the resulting pits at these locations would have been infilled since the mining ceased. In addition there are three old pits to the west of Sheering Road (clay and gravel) which are likely to have been infilled. All of these potentially infilled pits have the potential to generate ground gases.

8.2.5 Made Ground

Made ground is not identified on the geological map covering the Study Area on the BGS website. However, there are areas of developed land and roads within the Study Area and it is anticipated that a thin cover of made ground may be present in some areas including the M11, Sheering Road, and the Gilden Way (B183).

The Envirocheck artificial ground map shows an area of made ground directly east of the central roundabout on Gilden Way, which now used as a recreation ground. Another area of made ground is located 200m to the west of Sheering Road which is now overlaid by a small waterbody. There is also an area of reworked ground where Gilden Way connects to Marsh Lane.

The Envirocheck historical map shows some potential areas of infilled / contaminated industrial land within the Study Area These include four mineral extraction sites and two clay/gravel pits as summarised in the ground gas section above. In addition, where Gilden Way connects to Marsh Lane is the site of a demolished building (present 1923-1982). There may be made ground associated with this site as a result of the demolition.

8.2.6 Summary of Potential Sources of Contamination

Potentially contaminative land uses on site and within 250m are summarised as:

- Infilled pits and old mineral extraction sites west and south of Sheering Road;
- Infilled pit previously monitored for gas potentially infilled with domestic waste.
- Made ground from existing road constructions (M11, Sheering Road and Gilden Way, other isolated areas and reworked ground (Gilden Way connection to Marsh Lane);
- Fertilisers, pesticides used on agricultural land and allotments (adjacent to Gilden Way); and
- Industrial areas along Gilden Way including a fire station, an ambulance station and a road haulage company.

In addition the Moor Hall Landfill site is location 250m to the south of the proposed route. This will not be impacted by the proposed works so can be discounted from further assessment.

8.2.7 Superficial Deposits

The British Geological Survey map covering the Study Area shows a band of head deposits (~300m across) covering the centre of the proposed Gilden Way link road, extending to an increased width northwards and becoming narrower to the south. The Head deposits also extend in a narrow band eastwards crossing the campions and north of the proposed M11 Junction 7A route, with isolated occurrences to the west of the M11. There is a band of Glaciofluvial deposits (comprising Sand and Gravel) parallel to the proposed Gilden Way link road (east - west) in the western section. The remaining eastern and western areas of the proposed Gilden Way link road and the majority of the M11 comprise the Lowestoft Formation (Diamicton).

8.2.8 Solid Geology

The centre of the proposed Gilden Way link road area (extending north and south) is underlain by the Lewes Nodular Chalk Formation with the eastern and western areas (extending north and south) underlain by the Thanet Sand Formation and Lambeth Group. The area to the east of Gilden Way and the rest of the Study Area west of Sheering Road across to the existing M11, is underlain by the London Clay Formation, comprising clay, silt and sand.

8.2.9 Hydrogeology

The Environment Agency Bedrock Aquifer map and groundwater vulnerability map shows the majority of the Scheme to be within a non-aquifer zone (London Clay), which is classified as unproductive strata. The eastern and western area of the proposed Gilden Way link road is classified as a Secondary A Aquifer of Intermediate vulnerability (Thanet Sand Formation and Lambeth Group) with the centre (extending north and south) classified by the Environment Agency as a Principal Aquifer of High vulnerability (Lewes Nodular Chalk Formation).

The Environment Agency classifies the superficial deposits of Head, as Secondary Undifferentiated Aquifers with the Glaciofluvial deposits classified as a Secondary A aquifer, capable of supporting water supplies at a local rather than a strategic scale, and in some cases forming an important source of base flow to rivers. The Head and Glaciofluvial deposits have a Minor Aquifer High-Intermediate

Groundwater Vulnerability classification. The Lowestoft Formation is classified as Unproductive Strata and has negligible significance for water supply or river base flow.

Although the proposed Scheme does not fall within a groundwater Source Protection Zone there are a number of discharge consents and two groundwater abstractions (~100m and ~200m from the route) and one surface water abstraction consent (~250m from the route) in the Study Area to the east of Sheering road. The discharge consents are in the housing area close to Moor Hall Road (~140 and ~200m from route), just south of Matchings Road (~120m and ~130m from route), at Mayfield Farm (~40m from route) and at Sheering Hall farm (~250m from route).

The western extent of the proposed Scheme lies above the North Mymms Tertiaries groundwater body, which is a sensitive Drinking Water Protected Area (*pers comm*., Environment Agency). This groundwater body is currently classified as being of 'Poor' Chemical Status under the Water Framework Directive (WFD) (see Section 13 for more information on the WFD).

8.2.10 Other Environmentally Sensitive Areas

The Scheme is within a designated Surface Water Nitrate Vulnerable Zone, as established under the EU Nitrates Directive for the purpose of protecting drinking water quality and a drinking water safe guard zone. There are no Regionally Important Geological Sites within the Study Area.

8.3 Value of the Environmental Resources and Receptors

Assessment of the effects that the development could have on the environment will follow guidance from DMRB, Volume 11, Section 2 as outlined in Section 3.4. Based on a review of the available information, it is considered that the value / sensitivity of the geo-environmental conditions within the proposed Study Area are generally Low (low or medium importance and rarity, local scale) given that the land is primarily developed for agriculture and the majority of the land is underlain by non-productive strata. For the proposed Gilden Way link road section of the Study Area, the value / sensitivity of receptors would be considered Medium to High. This sensitivity is based on the area being industrial, resulting in a number of potential contamination sources. The underlying receptors are considered to have medium to high sensitivity to potential contamination as the area is underlain by superficial deposits classified as Secondary Undifferentiated and Secondary A aquifers. These deposits are underlain bedrock classified as Principal and a Secondary A Aquifers, which are considered to be of high value/sensitivity as they are important for regional water storage. .

8.4 Proposed Scope of Assessment

The site investigation for the Scheme is currently ongoing and will target potential sources of contamination identified in this section.

The investigation will target potential sources of contamination identified, namely:

- Agricultural use of land on and around the Scheme;
- Farms;
- Filled in gravel and clay pits (particular area of note is a pit located where Gilden Way connects to Marsh Lane);
- Made ground (at existing roads); and
- Industrial areas along Gilden Way: including a fire station, an ambulance station and a road haulage company.

Site investigations would be followed by implementation of a remediation strategy if necessary.

8.4.1 Potential Mitigation

Measures to mitigate any potential impacts due to the presence of contaminated ground or groundwater will be determined based on the findings of the site investigations. These may include:

- Using cut-off ditches or installing geotextile silt fences around excavations or exposed ground and stockpiles to prevent the uncontrolled release of sediments to surface waters;
- Incorporating secondary and tertiary containment measures where appropriate, such as tank bunding and oil interceptors to reduce potential impacts to surface waters from accidental spillages;
- Pre-mixing the required concrete off-site or limiting the mixing and handling of wet concrete to designated areas to reduce the potential impacts to surface waters from concrete or cement products; and
- Incorporating secondary and tertiary containment measures where appropriate, such as tank bunding and oil interceptors to reduce potential impacts to groundwater from accidental spillages.

8.5 Proposed Assessment Methodology

With respect to geology and soils, there is no formal guidance on the assessment of impacts within DMRB. Therefore, the proposed approach is that an element of professional judgement be applied when assessing each potential impact, and that this is documented within the ES.

Aspects to be considered in further detailed survey work include:

- the proximity of the Scheme to nearby receptors e.g. residential properties;
- the proximity of potential areas of contaminated land to local watercourses e.g. the Pincey Brook;
- the nature of the contamination which could be present, and their potential ease of mobilisation; and,
- the extent to which any existing contamination could be remediated as a result of the proposed Scheme.

9. Materials

9.1 Introduction

Currently there is no chapter on materials detailed in the DMRB guidance. However, it is proposed that draft DMRB Volume 11, Section 3, Part 6, Materials guidance (HD 212/14)[27], which provides guidance on the likely impacts arising from use of materials in road projects is utilised. According to the guidance, materials comprise the use of material resources and the generation and management of waste products.

Material resources include the materials and construction products required for the construction, improvement and maintenance of the road network. Materials include raw materials such as aggregates and minerals from primary, secondary or recycled sources, site-won materials, which could include road plantings and excavated substrata, and manufactured construction products. Manufactured construction products can include the materials required for the construction of the road surface, pre-cast elements for the construction of structures such as bridges, gantries and signage, barriers, lighting and fencing.

Waste arises primarily, although not necessarily exclusively, from two sources:

- Existing site materials, such as excavation of materials from earthworks, concrete from the demolition of existing structures or road plantings; and
- Materials brought on to site but not used for the original purpose, including damaged materials, off-cuts and materials surplus to demand.

Impacts are associated with the extraction and transport of raw materials, the manufacture of products and their subsequent transport to / from the construction site and final disposal. The assessment of materials can also include consideration of the embodied carbon in specific materials or construction products.

9.1.1 Proposed Study Area

The proposed Study Area is shown on the environmental constraints plan in Appendix A.

9.2 Previous Studies and Baseline Information

9.2.1 Baseline Sources

A desk based assessment will be undertaken to inform the baseline for the Materials Chapter.

Baseline data will be collected for regional and county level construction, demolition and excavation waste arisings as well as information on the local existing waste management recycling capacity, landfill void and the remaining landfill void space. The following data sources will be used:

- Regional level baseline information from data collected by the Environment Agency[28]; and
- County level baseline information from data provided in ECC and Southend-on-Sea Borough Council Addendum to the Replacement Waste Local Plan: Capacity Gap Report [29]

[27] Highways England, Draft DMRB, Volume 11, Section 3, Part 6, Materials HD 212/14, unpublished
[28] Environment Agency – Waste Management for England 2014 https://www.gov.uk/government/statistics/waste-management-for-england-2014 [Accessed 10-11-2015]
[29] Essex County Council Addendum to the Replacement Waste Local Plan: Capacity Gap Report https://www.essex.gov.uk/Environment%20Planning/Planning/Minerals-Waste-Planning-Team/Planning-Policy/Documents/Capacity_Gap_Local_waste_Arisings.pdf [Accessed 10-11-2015]

Baseline data on primary, secondary and recycled aggregates is from information provided in the Local Aggregate Assessment for Greater Essex ([30], The East of England aggregates working party: annual monitoring report [31] and The UK Government statistics from Mineral Extraction in Great Britain [32].At this stage of the project information on material quantities to be used on the Scheme and the precise quantities of material to be excavated from the proposed road cuttings and the amounts required to construct the road embankments are not known.

9.2.2 Minerals Availability

The East of England aggregates working party: annual monitoring report identifies primary aggregate and mineral sources in the East of England which includes Essex, Thurrock and Southend-on-Sea. The report identifies that sand and gravel sales in Essex, Thurrock and Southend-on-Sea in 2012 amounted to 2.3 million tonnes and the aggregate reserves were 35.5 million tonnes.

Due to European Union competition regulations, it is not possible to prescribe materials sources. However, given the above, it can be inferred that there is likely to be an adequate supply of aggregate from local sources. Nevertheless, it is expected that some materials would have to be transported from areas further afield than the Essex region; for example, steel, plastic and pre-cast concrete elements.

9.2.3 Local Waste Facilities

The ECC and Southend-on-Sea Borough Council Addendum to the Replacement Waste Local Plan: Capacity Gap Report identifies that there are 33 construction, demolition and excavation (CD&E) recycling facilities in the region as shown in Table 9.1.

Table 9.1: Number of CD&E recycling facilities and capacity in Essex

Facility Type	Number of Facilities in Essex (2012/13)	Estimated Total Capacity (tpa) in 2012/13
CD&E recycling facilities	33	1,636,237

This data does not include information on mobile recycling plants that are operating in the region as this information is very difficult to collate.

Environment Agency data identifies that there was approximately 1,150,000 tonnes inert landfill capacity within Essex in 2014. Table 9.2 below identifies the authorised landfill sites within 10 miles of the Scheme.

[30] Essex County Council, Southend-on-Sea Borough Council and Thurrock Council, Local Aggregate Assessment for Great Essex, September 2014 https://www.thurrock.gov.uk/sites/default/files/assets/documents/essex_local_aggregate_assessment_201409.pdf [Accessed 10-11-2015]

[31] Department for Communities and Local Government, East of England Aggregates Working Party, August 2013, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/285582/East_of_England_aggregates_working_party_-_annual_report_2012.pdf [Accessed 10-11-2015]

[32] Department for Communities and Local Government , Mineral Extraction in Great Britain 2013, February 2015 https://www.gov.uk/government/statistics/mineral-extraction-in-great-britain-2013 [Accessed 10-11-2015]

Table 9.2: Lists the authorised landfill sites within 10 miles of the Scheme

Name and address	Licence type	Permit number	Approx. distance from site
Boyton Hall Farm, Roxwell, Chelmsford, Essex	A4 : Household, Commercial & Industrial Waste Landfill	EPR/LP3799NJ/V002	9 miles
Crumps Farm, Stortford Road, Little Canfield, Dunmow, Essex, CM6 1SR	A4 : Household, Commercial & Industrial Waste Landfill	EPR/BB3438RJ/T001	7 miles
Elsenham Quarry, Hall Road, Elensham, Bishop's Stortford Hertforshire CM22 6DJ	Waste Landfilling; >10 t/d with capacity >25,000t excluding inert waste	XP3839AW	7 miles
Highwood Quarry, , Little Easton, Great Dunmow, Essex, CM6 2SL	L05 : Inert LF	EPR/AB3009HS/V002	8 miles
Leca Works, Mill Lane, Chipping Ongar, Ongar, Essex, CM5 9RG	A4 : Household, Commercial & Industrial Waste Landfill	EPR/MP3997NQ/V012	8 miles
Netherhall Landfill, Netherhall, , Roydon, Essex, CM19 5JX	A5 : Landfill taking Non-Biodegradable Wastes	EPR/XP3797NX/V002	5 miles
Pole Hole Farm, Eastwick Road, Pye Corner, Gilston, Harlow, Essex, CM20 2RP	A5 : Landfill taking Non-Biodegradeable Wastes	EPR/FP3391NV/A002	3 miles
Ugley Landfill Site, Cambridge Road, , Ugley, Hertfordshire, CM22 6HT	Waste Landfilling; >10 t/d with capacity >25,000t excluding inert waste	SP3934NW	10 miles

The Scheme will look to minimise the amount of waste that is be sent to landfill.

Generally, it is expected that some waste and materials storage would be carried out within local site compounds or soil storage areas. However, local facilities could also be considered for the construction phase of the Scheme.

9.3 Value of the Environmental Resources and Receptors

Receptor types likely to be at risk of impacts under this topic heading include:

- Resource depletion from quarries, other sources of minerals and other finite raw material resources;
- The capacity of waste management infrastructure, such as landfills, materials recovery facilities, composting sites, energy from waste plant and waste transfer stations etc; and
- National and local policy and targets relevant to materials and wastes.

9.4 Proposed Scope of Assessment

It is proposed that a detailed assessment be carried out, based on guidance contained in Draft DMRB Volume 11, Section 3, Part 6, Materials guidance (HD 212/14) . The assessment will consider the construction and operational phases with regards to materials used and waste generated. The scope of the assessment will concentrate on the potential effects from the use of primary, secondary and recycled raw materials, and manufactured construction products for the proposed Scheme. It will include assessment of the embodied carbon associated with the manufacture and transport of materials (although this does not include transport to site).

The assessment will not consider impacts associated with the carbon dioxide emissions connected with the transport of materials from the factory gate to site, construction activities, maintenance or decommissioning.

The environmental effects associated with the use of materials and generation of wastes will be considered in other Chapters.

9.5 Proposed Assessment Methodology

According to draft DMRB Volume 11, Section 3, Part 6, Materials guidance (HD 212/14) , an assessment of materials should be undertaken at least to Simple Assessment level. A Simple Assessment is qualitative and aims to identify the following:

i) Baseline data for the project in question, or at the earliest stages of the project cycle identify what forms of data will be required;

ii) The materials required for the project and where information is available, the quantities;

iii) The anticipated waste arisings from the project, and where information is available, the quantities and type (e.g. inert, non-hazardous, hazardous);

iv) The alignment of the project proposals with the regulatory and policy context, and stated project objectives;

v) The results of any consultation;

vi) The impacts/effects that will arise from the issues identified and whether these are likely to be significant; and

vii) A conclusion about whether this level of assessment is sufficient to understand the impacts/effects of the project or whether detailed assessment is necessary, and the identification of any mitigation measures.

Where there is the potential for the use and consumption of materials and the production and management of waste to cause significant environmental effects and where the extent of these can be quantified after the simple assessment then a detailed assessment will be carried out.

The detailed assessment of the use and consumption of materials should utilise and build on the information and data gathered at the simple assessment levels. To quantify the magnitude of change

associated with the Scheme's material requirements the embodied carbon emissions associated with specific materials or construction products will be calculated. This provides a mechanism to normalise the magnitude of the use and consumption of materials to permit the comparison of different materials as well as quantifying the magnitude of change. It will also identify whether the impacts which have been identified are beneficial or adverse, direct or indirect, short-term or long-term and permanent or temporary. The scale of the magnitude of impact will be ranked according to the scale summarised in Table 9.3.

Table 9.3: Scale of the impact magnitude

Scale of impact magnitude	Total CO2e of materials (tonnes)
No change	< 1,000
Negligible	1,000 – 5,000
Minor	5,000 – 20,000
Moderate	20,000 – 40,000
Major	> 40,000

The detailed assessment of waste will collate additional information to forecast as accurately as possible the quantities and types of waste which are likely to be produced by the Scheme. The potential environmental effects associated with waste relate primarily to the waste management methods identified and the effects that forecast waste arisings will have on the available waste management infrastructure. In this way, the assessment reflects both the relative quantities of waste produced and the position within the waste hierarchy of the chosen waste management methods.

The value/sensitivity of the receptor is defined as the available waste management infrastructure within an appropriate radius of the Scheme. The criteria for value/sensitivity of receptors and magnitude of impact for waste will be developed further during the EIA process.

10. Noise and Vibration

10.1 Introduction

Noise in its widest sense can be defined as unwanted sound. Such sound can be associated with industrial, domestic and transportation sources. Road traffic noise can be a source of complaint for people in their homes, their gardens and also outside in recreation areas. The impact upon other sensitive receptors and the enjoyment of these receptors is also important.

Vibration comprises oscillatory waves that propagate from a source through either the ground or the air to adjacent buildings. Although there is no evidence that traffic induced airborne vibration could cause even minor damage to buildings, it could be a source of annoyance to people, causing vibrations of doors, windows and, on occasions, floors of properties. Ground-borne vibration effects could potentially be produced during the construction phase relative to nearby receptors.

10.1.1 Proposed Study Area

It is proposed to use the methodology set out in DMRB, Volume 11, Section 3, Part 7, Noise and Vibration (HD 213/11)[33] to define the extent of the Study Area. First, detailed calculations are undertaken within a specified 'Calculation Area'. This encompasses all residential dwellings and other noise sensitive receptors within 600m of a proposed Scheme, and any routes bypassed by the Scheme, and for those roads (within 1km of a scheme) on the existing road network that are predicted to result in noise changes of 1dB in the year of opening or 3dB in the design year (usually 15 years after opening). Secondly, roads on the wider network (outside the Calculation Area) that will be subject to a 1dB increase or decrease in noise in the baseline year and / or a 3dB increase or decrease in the future assessment year are captured.

To define the Study Area, traffic information will be required to establish the potential change in noise levels for roads on the wider network. At the very least the Calculation Area for this Scheme will include an area 600m from the proposed carriageway alignment and any routes bypassed by the Scheme. Routes bypassed by the Scheme are considered to include the A414 between Gilden Way and J7 of the M11, and then the section of the M11 from J7 to where the proposed Scheme joins it. In addition, the Study Area is likely to expand much further due to changes in traffic on the local road network.

10.2 Previous Studies and Baseline Information

10.2.1 Baseline Sources

The baseline information contained in this report has been derived through professional judgement and consideration of available information of the area, as well as observations through a site walkover that has been undertaken.

10.2.2 Existing and Baseline Knowledge

The existing noise environment in the immediate area of the Scheme is dominated by road traffic noise, particularly from the M11 and Gilden Way (B183). The contribution from these sources of road traffic noise to a receptors noise environment will depend on a receptors proximity to either source.

"Important Areas" have been identified and published by Defra, and are defined as being areas that "with respect to noise from major roads will be where 1% of the population that are affected by the highest noise levels from major roads".

A number of "Important Areas" exist in and around Harlow, of which the following are likely to be contained with the Study Area:

[33] DMRB, Volume 11, Section 3, Part 7, "Noise and Vibration" (HD 213/11 – Revision 1), November 2011

- Felmongers, adjacent to the A414, approximately 100m south of First Avenue roundabout;
- Pytt Field, adjacent to the A414, approximately 50m south of Second Avenue roundabout;
- Priority Court, adjacent to the A414, approximately 25m south of Clockhouse roundabout;
- Nicholls Field, adjacent to the A1025 (Second Avenue), approximately 150m west of Second Avenue roundabout;
- Great Brays, adjacent to the A1025 (Second Avenue), approximately 500m west of Second Avenue roundabout;
- Spinning Wheel Mead, adjacent to the A1169, approximately 300m west of Clockhouse roundabout;
- Chamberlains, St Stephens Cottages (2 No) and Feltimores Cottages (2 No) , Chalk Lane, adjacent to the M11;
- Mead Cottage and Hobbs Cross Cottage, Hobbs cross Road, Hobbs Cross – adjacent to the M11;
- Majority of the eastern edge of Church Langley Housing Estate, adjacent to the M11;
- Crabbs, Mill Street, adjacent to the M11;
- Ty-Gywn,& Timbertop, Harlow Common, adjacent to the M11; and
- 1-4 Canes Cottages, Canes Lane (A414).

10.3 Value of the Environmental Resources and Receptors

HD 213/11 provides examples of sensitive receptors, including dwellings, hospitals, schools, community facilities, designated areas (e.g. Areas of Outstanding Natural Beauty, National Parks, SAC, SPA, SSSI) and PRoW. Of these, only residential properties and PRoW exist in close proximity to the proposed Scheme.

10.4 Proposed Scope of Assessment

HD 213/11 recommends that a ‘Detailed’ assessment be undertaken where certain threshold noise and vibration criteria are exceeded (Section 3). The introduction of the proposed Scheme is likely to result in perceptible noise and vibration increases; therefore, a ‘Detailed’ assessment should be undertaken.

Traffic flow information will be required before any further assessment can be undertaken. This will enable the production of a noise model to determine the noise level changes for all nearby receptors. In addition, the potential impacts on the wider roads can be established and assessed. Baseline noise, and if necessary, vibration levels will also be obtained as part of a more ‘Detailed’ assessment at representative properties in close proximity to the proposed Scheme.

10.5 Proposed Assessment Methodology

10.5.1 Construction Noise

It is proposed to utilise Method 2 from BS 5228-1: 2009 + A1: 2014[34] to predict the significance of noise impacts during typical construction works. Method 2 takes account of both residential properties and other sensitive receptors.

Method 2 – The 5dB(A) Change Method: Noise levels generated by construction activities are deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise by 5dB or more, subject to lower cut-off values of 65dB for the daytime period, 55dB for the evening period and 45dB from the night-time period ($L_{Aeq, period}$), from construction noise alone. This applies for a duration of one month or more, unless works for a shorter duration are likely to result in a significant effect. The evaluation criteria are generally applicable for residential housing, hotels and hostels, buildings in religious use, schools and health or community facilities.

10.5.2 Construction Vibration

It is proposed to utilise BS 5228-2: 2009 + A1: 2014[35], which contains guidance on vibration levels in structures from construction works and provides a prediction methodology for mechanised construction works. The Standard also presents guidance for the control of vibration from construction works. BS 5228-2: 2009 provides guidance on the human response to vibration, reproduced from BS 6472-1[36]. The Standard provides guidance for predicting human response to vibration in buildings. For construction works, the guidance contained in Table 10.1 is provided:

Table 10.1: Guidance on the Human Response to Vibration Levels from BS 5228-2

Vibration Level (ppv)	Effect
0.14mm/s	Vibration might just be perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration
0.3mm/s	Vibration might just be perceptible in residential environments
1.0mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents
10.0mm/s	Vibration is likely to be intolerable for any more than very brief exposure to this level

For building structure response, BS 5228-2 reproduces the advice given in BS 7385-2[37], giving guidance on vibration levels which could result in building damage. The response of a building to ground-borne vibration is affected by the type of foundation, underlying ground conditions, the building construction and the state of repair of the building. Table 10.2 reproduces the guidance in BS 5228-2 on building classification and guide values for cosmetic building damage.

Table 10.2: Guidance on the Effects of Vibration on Building Structures from BS 5228-2

Type of Building	PPV in frequency range of predominant pulse

[34] BS 5228:2009 Code of practice for noise control on construction and open sites – Part 1: Noise, 2009
[35] BS 5228:2009 Code of practice for noise control on construction and open sites – Part 2: Vibration, 2009
[36] BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings — Part 1: Vibration sources other than blasting, 2008
[37] BS 7385-2:1993 Evaluation and measurement for vibration in buildings — Part 2: Guide to damage levels from groundborne vibration, 1993

	4Hz to 15Hz	15Hz and above
Reinforced or framed structures	50mm/s	50mm/s
Industrial and heavy commercial buildings		
Un-reinforced or light framed structures	15mm/s at 4Hz increasing to 20mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above
Residential or light commercial buildings		

Minor damage is possible at vibration magnitudes greater than twice those given in Table 10.2, with major damage at values greater than four times the values given. BS 7385-2 also notes that the probability of cosmetic damage tends towards zero at 12.5mm/s peak component particle velocity.

10.5.3 Operational Noise

It is proposed to utilise Section 3 of HD 213/11, which provides guidance on the magnitude of impacts for traffic noise. Magnitudes of impact are considered for both the short-term and long-term. A change in road traffic noise of 1dB(A) in the short-term, for example when a project is opened, is the smallest that is considered perceptible. In the long-term, a 3dB(A) change is considered perceptible. The classification of noise impact, as provided by HD 213/11, is detailed in Tables 10.3 and 10.4. For the assessment of night-time noise impacts, HD 213/11advises that, until further research is available, only impacts in the long-term shall be considered. Therefore, it is proposed that the classification in Table 10.4 is used for determining night-time noise impacts. In addition, HD 213/11advises only those sensitive receptors predicted to be subject to a noise levels exceeding 55 dB $L_{night,outside}$ should be considered.

Table 10.3: Classification of Magnitude of Noise Impacts in the Short-Term

Noise Change $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1 – 0.9	Negligible
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

Table 10.4: Classification of Magnitude of Noise Impacts in the Long-Term

Noise Change $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

10.5.4 Operational Vibration

It is proposed to utilise HD 213/11, which advises that, should the level of vibration at a receptor be predicted to rise to above a level of 0.3mm/s, or an existing level above 0.3mm/s is predicted to increase, then this should be classed as an adverse impact from vibration.

11. Effects on All Travellers

11.1 Introduction

This Chapter covers the potential impacts of the proposed Scheme on All Travellers including pedestrians, cyclists, equestrians and bus travellers. Pedestrians, cyclists and equestrians are also referred to as Non-Motorised Users (NMUs). It also considers whether vehicle travellers could be significantly affected in terms of driver stress and their views of the road (i.e. driving conditions).

A key issue for the Harlow area is that the current Junction 7 of the M11 is the only link to the strategic road network. Therefore, the transport priorities for the west of Essex (including Harlow) include improving access to and from the M11 corridor, reducing congestion and providing transport improvement to support growth in terms of housing and employment.

11.1.1 Proposed Study Area

The initial proposed Study Area is shown on the environmental constraints plan in Appendix A. Similar to the air quality and noise and vibration topics, the proposed Study Area for All Travellers is likely to need to increase for this topic once the traffic model for the Scheme has been fully developed.

11.2 Previous Studies and Baseline Information

11.2.1 Baseline Sources

Information within this Chapter is based on publicly available data including the ECC, Essex Highways, Sustrans and the Department for Transport (Dft) websites.

11.2.2 Pedestrian, Cyclist and Equestrian Routes (NMUs)

Within the local area, there is a mixture of public footpaths, public bridleways and recreational paths[38]. The nearest footpaths include:

- 204_17 running to the north of the proposed Scheme along Pincey Brook close to Sheering Road;
- 204_29 running to the north of the Campions residential area;
- 204_30 running southwards from Sheering Road to Moor Hall Road;
- 204_35 follows Marsh Lane from the B183 and connects to 204_29 further north;
- 185_14 extends to the north and south of the B183 roundabout and joins Sheering Road near Churchgate Street;
- 185_22 running south of Gilden Way near the intersection with Mulberry Green;
- 185_20 running from Gilden Way in a southerly and then easterly direction to join FP22 west of St. Mary's Church;
- 185_135 and 185_168 running north and south of Gilden Way at the Norman Booth recreation centre; and

[38] Essex Highways, Public Rights of Way, http://www.essexhighways.org/Transport-and-Roads/Getting-Around/Public-Rights-of-Way/Interactive-map.aspx [Accessed on 14-12-15]

- 185_136 running in an easterly direction to Gilden Way south of the Norman Booth recreation centre.

In addition, there is a public footpath running adjacent to Gilden Way on the northern side, extending from the London Road roundabout to subway at the intersection of Gilden Way and The Oxleys.

Most of the cycle routes close to the Harlow area are within the town centre itself. According to Sustrans[39], the nearest traffic-free cycle routes are over 1km to the west of the Study Area. The nearest on-road cycle route (National Cycle Network Route 1) is via Moor Hall Road, running directly to the south of the proposed Study Area. It is unlikely that these will be affected by the proposed Scheme.

The nearest bridleway is over 500m to the east of the M11 motorway which and is unlikely to be affected by the proposed Scheme.

11.2.3 Public Transport

Bus routes using Sheering Road / Gilden Way (B183) include route 322 (Old Harlow to Saffron Walden), Route 59 (Harlow Town Centre to Chelmsford Town Centre) and Network Harlow route 7 (Churchgate Street and Mark Hall to Harlow). Bus routes 47 (Harlow Town Centre to Ongar) and 147 (Harlow Town Centre to Toot Hill) use a combination of Moor Hall Road and Sheering Road. These routes are likely to be temporarily impacted during construction of the Scheme due to short term road closures and changed traffic conditions. In the long term, these bus routes would experience a beneficial impact due to improved traffic conditions, accessibility and a reduction in congestion.

The nearest train station is Harlow Mill, which is over 1km to the west of the Study Area. This railway line includes regular services to London to the south and Cambridge to the north. The alignment of the railway line runs approximately 500m to the north-west of the Study Area at the nearest point. Rail travel is unlikely to be affected by the proposed Scheme.

11.2.4 Vehicle Travellers

The proposed Scheme aims to create additional access to the M11 to ease traffic congestion at Junction 7 and at the A414 to Harlow[40]. Other primary objectives of the proposed Scheme include enhancing transport accessibility to and from Harlow and reducing congestion and delays primarily along the A414 corridor[41].

Analysis of the current traffic levels is subject to a traffic model which is currently under development. It is proposed to include this analysis as part of the ES.

According to the DfT[42], total traffic numbers between Junction 7 and 8 for 2012 (i.e. northbound and southbound) include a daily average of 90,398 motor vehicles. This includes an average of 387 motorcycles, 69,404 cars / taxis, 662 buses / coaches, 11,254 light goods vehicles and 8,690 heavy goods vehicles. These numbers will be reduced with the incorporation of a new Junction between Junctions 7 and 8.

Gilden Way/ Sheering Road (B183) is a two-lane carriageway with no on road parking facilities. Street parking is available in nearby local roads including Chippingfield, Mulberry Green, The Oxleys and a short stretch of Sheering Road between Moor Hall Road and Gilden Way (B183).

[39] Sustrans, Harlow, Essex, www.sustrans.org.uk [Accessed on 13-08-13]
[40] Mouchel, Environmental Constraints, Risks and Opportunities Study, M11 Junction 7A Harlow, November 2010
[41] Mouchel, Highway Design Further Feasibility Study and Preliminary Works Cost Estimate, Harlow M11 Junction 7A, March 2011
[42] Department for Transport, Traffic Counts, http://api.dft.gov.uk [Accessed on 13-08-13]

11.2.5 Views from the Road

The proposed Study Area is characterised by residential / community land uses and open, arable land with small areas of woodland. Views of the M11 are possible above hedgerows from taller vehicles along Gilden Way / Sheering Road (B183)north of the Pincey Brook. Views from vehicles along Sheering Road and Gilden Way south of the Pincey Brook and along Moor Hall Road are generally well screened by roadside plantings, with intermittent views of residential dwellings and other community facilities including schools and sporting grounds.

11.2.6 Driver Stress

The existing Gilden Way / Sheering Road (B183) is a narrow, winding route that could contribute to driver stress. The fear of accidents could be apparent along this route, especially given the existing speed limit of 60mph. The entrances to properties along the B183, such as the Campions residential area and Mayfield Farm, means that vehicles may reduce speed to enter these areas, resulting in a lack of consistent traffic flow, particularly where there are bends in the road.

11.3 Value of the Environmental Resources and Receptors

The resources are the routes within the Study Area used by travellers, and the receptors are the travellers potentially impacted by the proposed Scheme. There is no standard guidance on applying values to resources and receptors for All Travellers. Therefore, it is proposed that each resource and receptor be considered on an individual basis, and factors influencing its sensitivity taken into account in assessing the significance of impacts.

11.4 Proposed Scope of Assessment

It is proposed that further assessment will mainly be conducted as a desk study, and will consider the routes used by NMUs and vehicle travellers within the Study Area and the potential impacts of the proposed Scheme.

11.5 Proposed Assessment Methodology

It is proposed that the assessment of potential effects on pedestrians, cyclist and equestrian routes (NMUs) and bus travellers will be undertaken with guidance from DMRB, Volume 11, Section 3, Part 8[43].

It is proposed that the assessment of views from the road and driver stress will be carried out with guidance from DMRB, Volume 11, Section 3, Part 9.[44]

[43] Highways Agency, DMRB, Volume 11, Section 3, Part 8, Pedestrians, Cyclists, Equestrians and Community Effects, 1993
[44] Highways Agency, DMRB, Volume 11, Section 3, Part 9, Vehicle Travellers, 1993

12. Community and Private Assets

12.1 Introduction

It is proposed that this Chapter covers the potential effects of the proposed Scheme on people and communities and considers agricultural land and farming businesses, access to community facilities; and effects on private property, development land, and the local economy.

Guidance for Community and Private Assets is provided in DMRB Volume 11, Section 3, Parts 6[45] and 8[46] (Land Use, and Pedestrians, Cyclists, Equestrians and Community Effects respectively) and IAN 125/09[47] which combines the Pedestrians, Cyclists, Equestrians and Community Effects and Vehicle Travellers DMRB guidelines.

12.1.1 Proposed Study Area

The proposed Study Area is shown on the environmental constraints plan in Appendix A. The proposed Study Area considers local residential properties; agricultural land and farms; businesses; land set aside for development purposes; and community facilities within the local vicinity of the proposed Scheme.

12.2 Previous Studies and Baseline Information

The baseline information provided in this report is derived from a desk-based study covering the proposed Study Area and observations made during site visits. The desk-based study used publicly available data including ECC, Harlow Council and Epping Forest District Council websites.

12.2.1 Residential Property

The closest residential areas to the proposed Scheme include:

- The Campions, a small hamlet of approximately a dozen properties on the west side of Sheering Road (B183);
- 163 Sheering Road, a stand-alone residential property just south of Pincey Brook;
- Sheering Hall, which is located just north of the Pincey Brook;
- Dwellings lining the north and south sides of Gilden Way in the vicinity of Mulberry Green and the Oxleys; and
- Residential areas within Old Harlow and Churchgate Village.

12.2.2 Agricultural Land and Farms

The proposed Scheme would cross agricultural fields associated with Mayfield Farm (on Sheering Road) and Morgan Farm (on Moor Hall Road). The farming within this area is predominantly arable. To the west of Sheering Road (B183), there are several horse paddocks surrounding the Campions residential area. The widening of Gilden Way would be undertaken adjacent to small allotment gardens to the east of the London Road roundabout. Agricultural fields currently exist to the north of the B183 roundabout, however this land will be used for a planned development (Harlowbury) under

[45] Highways Agency, DMRB, Volume 11, Section 3, Part 6, Land Use, 2001
[46] Highways Agency, DMRB, Volume 11, Section 3, Part 8, Pedestrians, Cyclists, Equestrians and Community Effects, 1993
[47] Highways Agency, IAN 125/09, Supplementary guidance for users of DMRB Volume 11 Environmental Assessment, October 2009

planning permission HM/PL/00055 for 1,200 dwellings, with community facilities, employment and public open space due to be constructed between 2016 and 2018[48].

12.2.3 Local Businesses

There are a few small businesses within the proposed Study Area including Mayfield Farm bakery and café, and Churchgate sausage shop which are both within the Mayfield farm buildings. Quinton Associates are located within the Campions residential area on the west side of Sheering Road and Gardencare Tree Services is located within Sheering Hall to the north of Pincey Brook. IDS Consultants are also located within Morgan Farm on Moor Hall Road. The Norman Booth recreation centre and a plant nursery are located on either side of Gilden Way near Elderfield, approximately 550mto the east of the London Road roundabout.

12.2.4 Development Land

A corridor of land between the east of Harlow urban area and the M11 is a possible future development site for employment and housing as identified in the Emerging Local Plans for both Harlow District and Epping Forrest District. As discussed in Section 12.2.2, the Harlowbury planned development lies within the Study Area to the north of Gilden Way and is due to be constructed between 2016 and 2018.

12.2.5 Land used by the Community

There are several public footpaths in the proposed Study Area which are used by local walkers and residents. The Mayfield Farm bakery, café and sausage shop are also well used areas by the local community. There is also a craft shop and dance school associated with the Mayfield Farm property. Gibberd Garden (a Registered Park and Garden) is a public area accessed via Marsh Lane, and includes a sculpture collection, a wild garden, and an arboretum of young trees.

There are several schools in or adjacent to the Study Area, including:

- Fawbert and Barnard's Primary School on the corner of Gilden Way and London Road;
- Mark Hall Specialist Sport College on the south west side of the London Road roundabout;
- Harlowbury Primary School, 225m to the north of Gilden Way off Watlington Road; and
- Saint Nicholas School and Churchgate Church of England Aided Primary School on Hobbs Cross Road, approximately 650m to the south of Gilden Way.

Other community facilities in the vicinity of Gilden Way include the Harlow Cricket Club, Old Harlow Fire Station, Norman Booth recreational centre, Churchgate Street Post Office and places of worship including Saint Mary and St Hugh Church of England on Churchgate Street and the Catholic Church of the Assumption on High Street, Old Harlow.

12.3 Value of the Environmental Resources and Receptors

There is currently no guidance within DMRB for measurement of the value or sensitivity of receptors for this topic and no agreed scale. Therefore, it is proposed that professional judgement will be used to consider the sensitivities of each resource and receptor on an individual basis.

It is proposed that residential properties be assessed on the basis of the level of severance and land take. Farming businesses and agricultural land will be assessed with consideration of the quality and quantity of the proposed land take and the consequences for maintaining farming viability. Local businesses and development land will be assessed on an individual basis. It is proposed that land

[48] Barratt Strategic, Persimmon Homes and Taylor Wimpey – Harlowbury: Land North of Gilden Way Environmental Statement, January 2011

used by the community be assessed based on the level of continued accessibility to the general public.

12.4 Proposed Scope of Assessment

Although no established guidance exists for this topic, it is proposed that the assessment of effects on people and communities draw on the assessment of land use from the previous DMRB Volume 11, Section 2, Part 6, with some alterations based on professional judgement. It is proposed that access routes to community facilities are not assessed within this Chapter as it will be accounted for in the 'All Travellers' Chapter. Potential impacts of the Scheme on agriculture, tourism, recreation and amenity, and the local economy will also be considered as part of the final ES.

Land Use topics requiring consideration under DMRB include: demolition of private property; loss of land used by the community; effects on development land; effects on agricultural land and effects on individual farm units.

12.5 Proposed Assessment Methodology

It is proposed that each potential impact associated with the proposed Scheme be assessed using professional judgement due to the absence of guidance for the determination of impacts and their significance. The assessment will include consideration of the following factors:

- temporary and permanent impacts and the duration of temporary impacts;
- type of impact, i.e. direct or indirect;
- nature of the impact, i.e. positive, negative or neutral;
- the duration and timing of the works i.e. time of day and day(s) in the week;
- the frequency of impact, i.e. continuous or intermittent, changing with time or constant;
- geographical context, i.e. international, national, regional or local; and
- how essential the affected features are to the functioning of the business or facility.

In relation to agricultural land, the following will be considered:

- the viability of the current local farm practices;
- the extent of any major reorganisation of the holding that may be caused by the Scheme;
- the extent of increased demands on management as a result of the Scheme; and
- agri-environment schemes.

13. Road Drainage and Water Environment

13.1 Introduction

It is proposed that this Chapter addresses the potential effects of the proposed Scheme on surface water and flood risk.

13.1.1 Proposed Study Area

The proposed Study Area is shown on the environmental constraints plan in Appendix A.

13.2 Previous Studies and Baseline Information

13.2.1 Baseline Sources

The information within this Chapter has been compiled from a desk study of the following sources:

- Environment Agency website;
- Envirocheck report from Landmark; and
- Local authority websites.

13.2.2 Catchment Characteristics

The Study Area lies within the Stort River Catchment. Within the proposed Study Area there is one 'Main River'[49], the Pincey Brook, and four ordinary watercourses[50]. Three of the ordinary watercourses are small drains and the fourth is a more substantial channel flowing from Newpond Spring to the River Stort Navigation. The ordinary watercourses have been referred to within this report as:

- Unnamed watercourse 1 – located near to Sheering Hall;
- Unnamed watercourse 2 – located near to Gilden Way by Ealing Bridge;
- Unnamed watercourse 3 – located along Gilden Way and near to the roundabout adjacent to the playing fields; and
- Unnamed watercourse 4 – flowing alongside the edge of Old Harlow.

There are also several small pond features and a lake located within the proposed Study Area. The catchment land use within the Study Area is predominantly rural, and Harlow is the largest urban area in the catchment, with a few smaller urban settlements also present.

The Pincey Brook is classified as a Water Framework Directive (WFD) water body and is currently achieving Poor Ecological Status, as per the 2014 Cycle 1 River Basin Management Plan data. Although not in the Study Area, the River Stort Navigation is also classified as a WFD water body and as a result of the unnamed watercourse 4 flowing into the water body, and this has also been included in the baseline assessment. Table 13.1 shows the WFD classification for both the water bodies. The assessment is taken from the River Thames River Basin Management Plan [51].

[49] A 'Main River' is defined as a watercourse shown as such on the statutory main river maps held by the Environment Agency and the Department of Environment, Food and Rural Affairs
[50] An 'ordinary watercourse' is defined as a watercourse that is not a 'Main River'
[51] Environment Agency, River Thames River Basin Management Plan, http://environment.data.gov.uk/catchment-planning/WaterBody/GB106038033380 [Accessed 2-11-2015]

Table 13.1: Environment Agency Water Framework Directive assessment for Pincey Brook and the Stort and Navigation B.Stortford to Harlow water bodies[52]

Element	Classification	
Water Body ID	GB106038033380	GB106038033281
Water Body Name	Pincey Brook	Stort and Navigation, B.Stortford to Harlow
Management Catchment	Upper Lee	Upper Lee
Hydromorphological Status	Not Designated as Artificial / Heavily Modified	Heavily Modified Water Body
Overall Ecological Status	Moderate Ecological Status	Moderate Ecological Potential
Biological Quality Elements		
Fish	No Data	High
Invertebrates	High	Good
Physico-chemical Quality Elements		
Ammonia (Phys-Chem)	High	High
Dissolved Oxygen	High	High
pH	High	High
Phosphate	Poor	Poor
Temperature	High	High
Hydromorphology Quality Elements		
Hydrological Regime	Supports Good	Supports Good
Morphology	Supports Good	No Data

The four unnamed watercourses are not classified as main rivers under the WFD, but form part of the River Stort Navigation and Pincey Brook WFD catchments. As a result they are considered as part of the two water bodies and any potential effect would be required to be assessed cumulatively with those directly impacting each Main River.

Unnamed watercourse 1 flows from the lake south of Housham Hall and drains through the middle of the agricultural fields where the principle component of the Scheme is located. It has a relatively small catchment and is not fed by any other tributaries. Unnamed watercourse 2 is shown in the Strategic Flood Risk Assessment[53] for the area located to the west of the fields by Mayfield Farm. Further site work will be required to identify the extent and condition of the watercourse.

Unnamed watercourse 3 is a small drain that runs alongside Gilden Way and through some agricultural fields. From studying aerial imagery the watercourse appears to be a road drain, with a uniform straightened channel. Further site work will be required to identify the sensitivity of the watercourse. Unnamed watercourse 4 is somewhat more substantial than the other ordinary watercourses and is fed by a series of drainage channels south of Gilden Way. Further site work will be required to assess the nature and sensitivity of the watercourse.

[52] Environment Agency, Environment Catchment Data Explorer (2015), http://environment.data.gov.uk/catchment-planning/WaterBody/GB106038033281 [Accessed on 2/11/2015]
[53] Epping Forest District Council and Harlow Council – Level 1 Strategic Flood Risk Assessment, April 2011

There are notable pond features within the Mores woodland, within Morgan's Farm, to the south of Gilden Way near Old Harlow and a lake to the north of the Campions, just south of Pincey Brook. These are likely to act as receptors for the drainage of the surrounding landscape.

13.2.3 Hydrology and Flood Risk

A Strategic Flood Risk Assessment was completed by HDC and EFDC in 2011, providing high level information on the water environment. The Study Area lies predominantly within a Flood Zone 1, which has a low probability of flooding. However parts of the Scheme, particularly along Gilden Way, lie within a Flood Zone 3 for both the Pincey Brook and unnamed watercourse 4. The NPPF requires a Flood Risk Assessment to be produced for all developments within a Flood Zone 1 and for Flood Zone 3 areas that are over one hectare in size.

Severe flood events have been recorded along the Pincey Brook in this area notably in 1947, 1978 and 2000[32].

The Pincey Brook and the two unnamed watercourses are in a surface water 1 in 30 year flood risk area[33]. Flood Risk Assessment Zones (FRAZs) are catchments of ordinary watercourses that either contribute to a 'Main River' or are a known historical area of flooding. The unnamed watercourse 1 adjacent to the Mayfield Farm is a FRAZ, as specified by the EFDC, and as a result any development application is required to be accompanied by a Flood Risk Assessment. The detail of the assessment depends on the size of the development.

Table 13.2 contains flow data for the Pincey Brook gauging station at Sheering Hall (1974-2012), which is located at TL495127 within the footprint of the proposed Scheme. The base flow index is 0.37, which is the proportion of the river runoff derived from groundwater and stored sources. The higher the base flow (i.e. closer to 1) the more sustained the watercourse will be during dry periods.

Table 13.2: Flow data for the Pincey Brook (source: Centre for Ecology and Hydrology)

Measure	Flow (m^3/s)
Mean Flow	0.313
95% Exceedance (Q95)	0.025
70% Exceedance (Q95)	0.059
50% Exceedance (Q95)	0.133
10% Exceedance (Q95)	0.67

The western extent of the proposed Scheme lies above the North Mymms Tertiaries groundwater body, which is a sensitive Drinking Water Protected Area (*pers comm*., Environment Agency). This groundwater body is currently classified as being of 'Poor' Chemical Status under the WFD. Groundwater in the Study Area is covered in more detail in Section 8.2.9.

13.2.4 Fluvial Geomorphology

The Pincey Brook has a sinuous planform and some morphological variation. The watercourse has in-channel macrophytes and some evidence of depositional features. The predominant land use is agricultural (arable and pasture). There appears to be a buffer strip between the ploughed / grazed fields and the river, composed of a variety of vegetation. Tree-lined banks suggest a stable channel, which is further supported by the historical map showing the proposed Study Area. These show that the planform of the Pincey Brook has not varied significantly since 1897. The only change in planform has been just south of Sheering Hall where a bend has been cut-off, forming a secondary channel.

The Pincey Brook does not appear to be modified, except at road crossings, particularly the crossing under the M11.

Additionally, under the WFD, the Pincey Brook is not designated as an artificial/heavily modified water body and is assessed to have morphology and quantity and dynamics of flow supporting Good Ecological Status. The unnamed watercourses 1, 2 and 3 are likely to be artificial for land or road drainage and as a result are likely to have fewer geomorphological features. From a site walkover, the unnamed watercourses 1 and 2 were seen to have limited geomorphological value. Little can be seen of the unnamed watercourse 3 from aerial maps, but the channel has a straight planform and is thought to again have a limited geomorphological value.

Unnamed watercourse 4 appears to have a more sinuous planform. Aerial imagery suggests that although the watercourse is bordered by a residential area, there is a continuous lining of tree and a vegetated riparian area. Little can be seen of the geomorphological forms and processes of the channel from aerial photographs and further site work will need to be undertaken to confirm this.

13.2.5 Water Quality

The Study Area is located within a Surface Water Nitrate Vulnerable Zone (NVZ)[54]. A NVZ is an area of land that drains into surface water known to be polluted by nitrates.

Road drainage will need to be considered to assess whether there are any water inputs to the watercourses in the footprint of the proposed Scheme and how these alter the water quality and physico-chemical elements under the WFD.

13.3 Value of the Environmental Resources and Receptors

Table 13.3 identifies the key environmental receptors assessed according to DMRB guidance to provide a preliminary sensitivity or importance value. It is possible that these values will change during the EIA process, particularly as the sensitivity of the watercourses are validated following a site visit. Using the baseline information, the water environment, comprising hydrology, geomorphology and water quality, is provisionally assessed to be of Medium to Negligible sensitivity (Table 13.3).

Table 13.3: Value (sensitivity) of the water environment receptors

Watercourse / Water Feature	Value / Sensitivity		
	Hydrology and Flood Risk	Fluvial Geomorphology	Water Quality
Pincey Brook	Medium	Medium	Medium
Unnamed watercourse 1	Low	Low	Low
Unnamed watercourse 2	Negligible	Low	Low
Unnamed watercourse 3	Low	Low	Low
Unnamed watercourse 4	Medium	Medium	Medium
Pond / lakes	Negligible	Negligible	Negligible

13.4 Proposed Scope of Assessment

A Flood Risk Assessment is required for the proposed Scheme.

[54] Environment Agency Interactive Maps, What's in your backyard, http://maps.environment-agency.gov.uk [Accessed on 10-09-13]

It is proposed that drainage information for the existing roads connecting into the proposed Scheme, including the M11 and local roads be requested. This will also detail the current levels of discharges into the surrounding watercourses, better informing any flood compensation design required. The drainage from the proposed Junction will also require further assessment.

Detailed designs will be required for the crossing of any of the unnamed watercourses throughout the Scheme. If the watercourses are to be culverted, the Regulator (Environment Agency) will require further detailed assessments before plans are accepted. This assessment will need to include the effects of the activity on the watercourses and the two WFD water bodies (Pincey Brook and River Stort Navigation), to ensure there is no deterioration or morphological, biological or water quality impacts. A WFD compliance assessment could be required; consultation with the Environment Agency will look to agree the scope of this assessment and the layout.

Assessment of the potential water quality impacts would be likely to be required, particularly if a Scheme proposal was to discharge directly to any of the watercourses or WFD water bodies. The form this takes will be agreed with the Regulator.

A Preliminary Risk Assessment for groundwater will be required if any part of the proposed Scheme lies above the North Mymms Tertiaries WFD groundwater body. Groundwater in the Study Area is covered in more detail in Section 8.2.9.

13.5 Proposed Assessment Methodology

It is proposed that the assessment be carried out in accordance with the guidance contained in DMRB (HD45/09)[55], including the use (if deemed applicable) of the Highways England Water Risk Assessment Tool for water quality assessments. Where appropriate, it is proposed that professional judgement is used to inform the assessment methodology, primarily in the geomorphology discipline, where there is (to date) a lack of prescriptive guidance A WFD compliance assessment could be required and this will be agreed with the Regulator. The Flood Risk Assessment will be carried out in line with the NPPF and accompanying National Planning Practice Guidance.

[55] Highways Agency, DMRB, Volume 11, Section 3, Part 10, Road Drainage and the Water Environment, 2009

14. Potential Cumulative Effects

14.1 Introduction

The EIA process will include an assessment of potential cumulative effects upon the environment. These effects result from the incremental impact of an action when added to other past, present or reasonably foreseeable actions. Firstly, there is a possibility for different receptors to be affected by a number of different environmental impacts i.e. identified by the different topics within this report. For example, local residents could experience air quality and noise and vibration impacts. Secondly, there is a possibility for a Scheme to be affected by different projects (i.e. other planning applications, schemes with planning permission but yet to be constructed and the delivery of housing allocation identified in the adopted local plans) within the local area which will also be considered within the ES.

14.2 Previous Studies and Baseline Information

The baseline information contained in this Chapter has been derived from a desk based assessment of the baseline environment within the local area. The information is based on publicly available data including the ECC and local District Council websites.

14.2.1 Interactions between Topics

In the context of the Scheme, it is possible that the environmental topics could interact with each other. Once detailed individual assessments have been carried out; the interactions between topics will be considered fully and a cumulative effects assessment undertaken as part of the EIA process.

14.2.2 Interactions with Other Projects

Towards the end of the EIA process, other significant planning permissions in the local area will be identified, including highways projects and non-highways projects in the local vicinity of the proposed Scheme. These will be agreed with the Local Planning Authority. Harlowbury (land north of Gilden Way)[56] is an example of a relevant project, located directly to the west of the indicative location of the proposed Scheme planning reference HW/PL/11/00055. This is a housing and employment development to be constructed between 2016 and 2018. Other committed developments[57] within the local area include the Newhall Phase 2 development[58] planning reference HW/PL/04/00302 involving the development of 2,500 dwellings. In addition, the London Road and Templefields Enterprise Zones to the south-west and west of the proposed Scheme respectively aim to create 6,000 and 1,000 jobs respectively in the local area. Potential future road projects, including the M11 Junction 7 improvements also need to be considered[59].

Certain developments could be included in the traffic modelling, and hence any traffic related impacts will not be assessed in this Chapter. These will be assessed predominantly within the noise and vibration, air quality and all travellers topics.

The traffic modelling includes three growth scenarios based on current committed growth, local plan allocation and emerging local plan growth,

14.3 Proposed Scope of Assessment

It is proposed that the other significant planning permissions and local plan allocations to be considered will be limited to a geographic area contingent with the receptors that could be impacted by the proposed Scheme. The scope of plans or projects to be included in a cumulative impact

[56] Barratt Strategic, Persimmon Homes, Taylor Wimpey – Harlowbury: Land North of Gilden Way Environmental Statement, January 2011
[57] Essex Highways, Proposal for new Junction 7A on M11 (Harlow), future development map, http://www.essexhighways.org/
[58] Information obtained from http://the.newhallproject.co.uk/development_details.html [Accessed on 14-12-15]
[59] Essex Highways, Proposal for new Junction 7A on M11 (Harlow), Alternatives, http://www.essexhighways.org/

assessment can be defined as those projects whose effects could overlap with the proposed Scheme in space or time.

14.4 Proposed Assessment Methodology

It is proposed that cumulative effects are assessed based on professional judgement after the other topics within the ES have been reported. The guidance that will be followed includes DMRB Volume 11, Section 2, Part 5 (Assessment and Management of Environmental Effects) including determining the significance of cumulative effects. In addition, IAN 125/15[60] provides guidance on the reporting of cumulative assessment. The Highways England's Major Project Instruction 04-012013[61] also includes criteria for identifying reasonably foreseeable projects.

Instead of reporting on every individual interaction, only the expected significant cumulative effects will be considered. The following will also be differentiated:

- temporary and permanent effects;
- direct and indirect effects; and
- positive and negative effects.

Where significant cumulative effects beyond those identified as residual effects from the scheme in isolation are identified, an assessment of the need for additional mitigation will be undertaken.

[60] Highways England, Interim Advice Note 125/15, Supplementary guidance for users of DMRB Volume 11 'Environmental Assessment', 2015.
[61] Highways England, Major Project Instruction, 04-012013, January 2013,

15. Planning Policy

15.1 Background and Spatial Context of the Development

Harlow is situated in the centre of the West Essex area and is the primary economic and growth centre, with between 12,000 and 15,000 new homes and 8,000 to 12,000 new jobs planned in the next 20 years (Current growth is identified in the adopted Local Plan/Core Strategy documents for each district and revised growth proposed in their emerging Local Plans).

Harlow is ideally placed, being close to the M11 and M25, on the West Anglia mainline and close to Stansted Airport. Access to Harlow is, however, somewhat restricted with only one link to the strategic road network (via Junction 7 of the M11) and two railway stations located on the edge of the town.

The primary means of road access to the town, the A414, also serves as an important through route. With high levels of traffic using this one route, congestion is common with its impacts often felt across the town's wider road network. A significant intervention is required to address the capacity challenges alongside some road improvements.

Furthermore, having largely been constructed in the 1950s and 1960s, much of the town's transport infrastructure is now ageing and was originally designed for a time of lower levels of car ownership and mobility.

The town centre is identified as an area for regeneration, two Local Enterprise Zones have been designated for employment growth and the area is proposing a further increase in housing in both Harlow District and Epping Forest District.

In order to facilitate and support this growth it is essential to improve access to the M11 and improve the transport flows in and around Harlow. This proposal to create an additional junction onto the M11 will not only relieve the congestion at Junction 7 but also improve traffic flows in and around Harlow by providing an alternative route to the north of the town.

15.1.1 National Planning Policy

At the heart of the **National Planning Policy Framework** (NPPF) is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-taking.

The 12 Core Principles set out in the NPPF includes the need to:

- *'proactively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs. Every effort should be made objectively to identify and then meet the housing, business and other development needs of an area, and respond positively to wider opportunities for growth. Plans should take account of market signals, such as land prices and housing affordability, and set out a clear strategy for allocating sufficient land which is suitable for development in their area, taking account of the needs of the residential and business communities;*
- *take account of the different roles and character of different areas, promoting the vitality of our main urban areas, protecting the Green Belts around them, recognising the intrinsic character and beauty of the countryside and supporting thriving rural communities within it;* '

Paragraph 90 of the NPPF also defines types of development in the Green Belt which are not inappropriate in policy terms, subject to certain criteria being met. This includes local transport infrastructure.

*‘**90.** Certain other forms of development are also not inappropriate in Green Belt provided they preserve the openness of the Green Belt and do not conflict with the purposes of including land in Green Belt. These are:*

- *mineral extraction;*
- *engineering operations;*
- *local transport infrastructure which can demonstrate a requirement for a Green Belt location;*
- *the re-use of buildings provided that the buildings are of permanent and substantial construction; and*
- *development brought forward under a Community Right to Build Order.*’

The M11 Junction 7a project is regarded as a local transport infrastructure scheme and not a Nationally Significant Infrastructure Project and therefore it does not need to be covered by national policy, however, it is worth noting that national policy supports transport infrastructure which addresses traffic congestion. The **National Policy Statement for National Networks** states:

‘*Traffic congestion constrains the economy and impacts negatively on quality of life by:*

- *constraining existing economic activity as well as economic growth, by increasing costs to businesses, damaging their competitiveness and making it harder for them to access export markets. Businesses regularly consider access to good roads and other transport connections as key criteria in making decisions about where to locate.*
- *leading to a marked deterioration in the experience of road users. For some, particularly those with time-pressured journeys, congestion can cause frustration and stress, as well as inconvenience, reducing quality of life.*
- *constraining job opportunities as workers have more difficulty accessing labour markets.*
- *causing more environmental problems, with more emissions per vehicle and greater problems of blight and intrusion for people nearby. This is especially true where traffic is routed through small communities or sensitive environmental areas*.’

15.1.2 County Planning Policy

The South East Local Enterprise Partnership identifies the need for growth in Harlow and recognises that the capacity of the existing access onto the M11 and the lack of an alternative access is a significant barrier to housing and economic growth. The **South East Growth Deal** states:

‘*The Local Enterprise Partnership and partners, including Essex County Council, commit to fund technical feasibility work and to produce the outline business case for the M11 Junction 7a scheme.*

The Highways Agency will work with the South East Local Enterprise Partnership and partners to conduct 7 necessary technical work required to develop the business case for the M11 Junction 7a scheme.’

The **Essex Growth Strategy 2012** sets out prioritised transport investment across the County and identified the need for an additional junction on the M11 to support economic and housing growth in Harlow: *‘Harlow· The provision of access and more reliable transport links to Enterprise West Essex at Harlow.· Transport improvements necessary for the delivery of the redevelopment of the town centre.·*

Construction of a new M11 J7a giving direct access from the strategic road network to development opportunities in north Harlow.[62]

Essex Local Transport Plan 2011 states as a list of priorities for the West Essex area:

- *Improving access to and from the M11 corridor;*
- *Tackling congestion and improving the management of traffic in Harlow town centre;*
- *Providing the transport improvements needed to support housing and employment growth;* [63]

The Local Transport plan also recognises that connectivity between the main towns in Essex is good but that the connectivity to the strategic transport network running through Essex is less satisfactory especially at peak times:

Connectivity by road

Connections by road between the four main towns of Basildon, Chelmsford, Colchester and Harlow are good as are connections between these and their surrounding local centres. Most journeys by car between each of the four towns can be achieved in under an hour. However, there are specific sections of road where congestion is common. These include the A127 and A130 in south Essex, the A414 to the east of Chelmsford and connections from north and west Harlow to the M11.[64]

The Essex Local Transport Plan has 15 policies of these, Policy 2 highlights the connection between growth and transport planning:

Policy 2 – Integrated Planning

'Transport and land-use planning will be used together to secure new development at the most appropriate and sustainable locations by:

- *working closely with district planning authorities to enable a better balance of new homes, jobs and services;*
- *locating new developments in areas which are accessible to key services by sustainable forms of transport;*
- *ensuring new developments provide for sustainable transport and effective travel planning;*
- *requiring new developments to provide appropriate transport infrastructure in line with the Council's current development management policies; and*
- *making the most effective use of all available funding sources by coordinating the delivery of ECC and development funded works.'*[65]

Policy 3 focusses of the need to improve the resilience of the transport network, to improve reliability and focus investment on the parts of the network that give the greatest economic and quality of life improvements:

Policy 3 – Congestion and Network Resilience

'The County Council will facilitate the improved reliability of journeys by:

- *undertaking its network management duty in line with the Traffic Management Act;*
- *monitoring and managing the impact of traffic through the Essex Traffic Control Centre;*

[62] Page 42 of the Essex Growth Strategy 2012
[63] Page 10 Essex Transport Plan 2011
[64] Page 46 Essex Transport Plan 2011
[65] Page 52 Essex Local Transport Plan 2011

- *focusing investment on those parts of the network that would give the greatest benefit to the economy and quality of life;*
- *using a functional hierarchy of routes to manage traffic;*
- *working with operators to improve the punctuality of bus services;*
- *minimising disruption by co-ordinating and managing the impact of roadworks undertaken by the County Council and utility companies;*
- *applying the Speed Management Strategy*.' [66]

Policy 5 identifies the framework for the delivery of improved connectivity within the transport network to support sustainable growth:

Policy 5 – Connectivity

'Transport networks will be strengthened to support a vibrant, successful and sustainable future for Essex by:

- *improving travel links within and between our main towns;*
- *focusing investment on routes where improvements will give the greatest benefit to the economy of Essex;*
- *improving journey times and journey-time reliability by targeting congestion improvement measures (see Policy 10);*
- *providing for the use of more sustainable forms of travel (see Policy 5);*
- *ensuring international gateways have effective surface access strategies that promote appropriate and sustainable transport;*
- *developing appropriate provision of park and ride facilities serving our main towns;*
- *working with partner agencies to identify and deliver essential improvements to nationally important road and rail connections*.'[67]

Policy 6 of the Local Transport Plan identifies the need for the strategic highway network to support economic growth, recognising the importance of freight movements to and along the strategic road network and into the County.

Policy 6 – Freight Movement

'The Council will manage the efficient movement of freight within the county by:

- *working with operators to ensure that heavy goods vehicles use identified routes and that other freight traffic uses the most appropriate routes;*
- *working with local businesses to promote and support the sustainable distribution of goods;*
- *working in partnership with the Highways Agency and neighbouring authorities to provide live travel information to freight operators;*
- *encouraging a shift of freight from road transport to rail transport*.' [68]

Specific reference is made to the need for improved access to the strategic network in particular access to the M11 from the West Essex area.

[66] Page 53 Essex Local Transport Plan 2011
[67] Page 56 Essex Local Transport Plan 2011
[68] Page 61 Essex Local Transport Plan 2011

Policy 9 of the Local Transport Plan recognises the need to deliver transport improvements while minimising the impact of development on the natural, historic and built environment:

Policy 9 – The Natural, Historic and Built Environment

'The County Council will protect the natural, historic and built environment from the harmful effects of transport by:

- *designing and implementing transport improvements and maintenance works that retain the integrity of the built environment, natural habitats and biodiversity, the natural and historic landscape, and water quality;*
- *minimising the visual and noise impacts of transport;*
- *addressing air quality issues through appropriate measures, particularly in designated Air Quality Management Areas*.' [69]

Priorities for highway investment in the West Essex Area as identified in the **Essex Local Transport Plan** are set out below:

'Priorities for West Essex

West Essex borders more of Essex's neighbouring authorities than any of the other planning areas. The character of the area is diverse, encompassing the edge of the London commuter-belt, the "new town" of Harlow, as well as historic rural towns and villages. The priorities for the area therefore reflect the importance of cross-boundary movements and the differing needs of local communities.

With significant housing and employment growth to be delivered in West Essex, particularly within and around Harlow, it will be essential to ensure that this is accompanied by measures which support access and promote the selection of sustainable travel choices. Priorities include:

- *Improving access to and from the M11 corridor;*
- *Tackling congestion and improving the management of traffic in Harlow town centre;*
- *Providing the transport improvements needed to support housing and employment growth;*
- *Improving cycling networks and walking routes and encouraging their greater use;*
- *Improving the attractiveness of public spaces and their ease of use.*

Links to London are vital, particularly to the south of the area, with much of the local economy closely tied to that of the Capital. Priorities therefore include working with Transport for London to improve the journey experience of Essex residents using the Central Line underground services, and lobbying government for improvements to West Anglia rail services.

With much of the area rural in character, access to employment and services for those is an important issue. Providing access to the local centres, to Harlow, and to essential services from rural areas and improving choices for travel between the centres are priorities.'[70]

The **Hertfordshire Local Transport Plan 2011** makes no mention of the opportunity for an additional Junction on the M11; the plan therefore has a neutral stance on the proposed development.

15.1.3 Local Plan Policy

The **Adopted Harlow Local Plan 2006** is silent on the issue of an additional Junction on the M11. However, the **Emerging Strategy and Options for the Harlow Local Development Plan 2014** sets out a vision for the area to 2031 which states:

[69] Page 75 Essex Local Transport Plan 2011
[70] Page 125 Essex Local Transport Plan 2011

'8. The town's land use and transport policies would have been coordinated to ensure the maximum possible increase in passenger transport, walking and cycling. Major investment would also be underway to address a number of specific transport capacity issues across Harlow which is currently restricting growth and investment. This would have included a new junction on the M11 and substantial improvements to the internal road network in Harlow.'[71]

Furthermore, the growth scenarios proposed illustrate the constraint caused by the lack of capacity and access to the motorway network and the need for an additional junction to the M11, with all scenarios requiring improved access to the M11 and identifying a preferred option of an additional junction recognising the limited potential to significantly increase capacity at Junction 7.

The **Epping Forest Combined Local Plan 1998 and 2006** contains no proposals relating to the M11 because it also contains no strategic housing allocations as the Structure Plan target for housing has been exceeded. However, the **Epping Forest Emerging Local Plan Consultation 2012** identifies the opportunities for growth around Harlow provided the necessary infrastructure is provided including a new junction onto the M11 between Junctions 7 and 8.

The **East Herts adopted Local Plan 2007** is silent on the issue of an additional junction onto the M11, however, The **East Herts Preferred Options Consultation 2014** recognises the need for improved transport infrastructure in order to bring forward housing and employment growth in the Gilston area near Harlow.

The **Uttlesford Adopted Local Plan 2005** makes no mention of the need for additional access to the M11 and the emerging local plan has been withdrawn. There is no new document published on their website currently.

15.1.4 Other planning policy context.

The application site is partially in Epping Forest DC and Harlow Council. Planning policy for both councils therefore needs to be taken into account. The aims of the Harlow Local Plan 2006 are set out below, they highlight the need to balance growth in homes and jobs with protecting the environment and ensuring that local infrastructure can accommodate increased demand.

Sustainable Development

a) To make the best use of all resources so needs of future generations are met;

b) To protect the natural environment, reduce greenhouse gases and thereby reduce adverse effects on global climate change;

c) To apply a sequential test to locations for development, maximising the re-use of buildings and previously developed land, and promoting mixed uses;

d) To ensure that the Local Plan reflects the needs of all residents.

Housing

a) To ensure that everyone has the opportunity of a decent home;

b) To meet the housing needs of all sectors of the community in a sustainable manner.

Economic Regeneration

a) To facilitate sustainable economic growth and regeneration;

[71] Emerging Strategy and Options for the Harlow Local Development Plan 2014

b) To broaden the base of employment opportunities and mixed land uses;

c) To meet the needs of those who depend on the town for jobs;

d) To maintain a vibrant and dynamic local economy.

Transport

a) To deliver an integrated transport system which provides for economic and social needs;

b) To promote more sustainable transport choice;

c) To reduce the need to travel, especially by car.

Leisure and Culture

a) To provide for a wide range of accessible leisure and cultural opportunities;

b) To include new facilities in appropriate locations;

c) To develop a continuing appreciation of Harlow's heritage.

The Natural Environment

a) To protect and enhance natural resources, including biodiversity and sites of nature conservation importance;

b) To sustain the character of the Green Belt and Green Wedges.

The Built Environment

a) To provide a high quality environment;

b) To ensure that all new development is of a high standard of inclusive design, safe and functional;

c) To protect buildings and places which have character and interest.

Regenerating the Town Centre and Shopping

a) To create a lively and viable Town Centre;

b) To enhance the environment of the town's shopping centres;

c) To improve the range of shops and related facilities accessible to local people.

Community Facilities and Public Utilities

a) To promote improved education, health and other community facilities which are accessible to all;

b) To ensure that adequate, sustainable public utility services are provided.

Implementation and Resources

a) To work in partnership with the community in the review process and implementation of the Local Plan and with other stakeholders, in recognition of the Council's enabling role.

The proposed junction is located within Epping Forest District Council area. Therefore policies within the adopted **Epping Forest Combined Local Plan 1998 and 2006** apply.

Policy CP1 - Achieving sustainable development objectives gives an overarching policy context for development in Epping Forest. It states that:

'*Planning powers and actions will be used to:*

(i) *avoid, or at least minimise, impacts of development upon the environment, particularly in ways likely to affect future generations. Where negative impacts cannot be avoided, compensatory measures will be required to offset such impacts, taking into account that social and economic activities depend upon the maintenance of a stable and healthy environment for their continuance;*

(ii) *secure the provision of sufficient types and amounts of housing accommodation, and different facilities, to meet the needs of the local population, and to retain and improve land resources to meet the recreational and countryside needs of the metropolitan area;*

(iii) *give effect to the Epping Forest Community Strategy (produced by the Local Strategic Partnership) which is in force at the time;*

(iv) *meet the employment needs of those who are unemployed and secure/achieve a mix of local employment and commercial activities that both meet local needs and reduce the need to travel, and reduce reliance on use of the private car;*

(v) *avoid further commuting, especially where it is dependent upon private car use;*

(vi) *help achieve prudent use of natural resources; and*

(vii) *minimise the use of non-renewable resources, including greenfield land.*'

Policy CP3 – New development sets out the approach to development management:

'*In considering planning applications and in allocating land for development, the Council will require the following criteria to be satisfied:*

(i) *the development can be accommodated within the existing, committed or planned infrastructure capacity of the area (or that sufficient new infrastructure is provided by the new development/developer);*

(ii) *the development is accessible by existing, committed or planned sustainable means of transport;*

(iii) *sequential approaches have been used to ensure that appropriate types of development, redevelopment or intensification of use take place at suitable locations;*

(iv) *the achievement of a more sustainable balance between local jobs and workers;*

(v) *the scale and nature of development is consistent with the principles of sustainability and respects the character and environment of the locality.*

The Council may use Planning Obligations to ensure these criteria are satisfied.'

The proposed Junction with the M11 is located in the Metropolitan Green Belt and therefore **Policy GB2A – Development in the Green Belt** applies.

'*Planning permission will not be granted for the use of land or the construction of new buildings or the change of use or extension of existing buildings in the Green Belt unless it is appropriate in that it is:*

(i) *for the purposes of agriculture, horticulture, or forestry; or*

(ii) *for the purposes of outdoor participatory sport and recreation or associated essential small-scale buildings; or*

(iii) *for the purposes of a cemetery; or*

(iv) *for other uses which preserve the openness of the Green Belt and which do not conflict with the purposes of including land in the Green Belt; or*

(v) *a dwelling for an agricultural, horticultural or forestry worker in accordance with policy GB17A; or*

(vi) *a replacement for an existing dwelling and in accordance with policy GB15A; or*

(vii) *a limited extension to an existing dwelling that is in accordance with policy GB14A; or*

(viii) *in accordance with another Green Belt policy*.'

The proposed junction will be located in the open countryside and on the edge of Harlow, therefore **Policy LL1- Rural landscape** will apply. It states that:

'*The Council will continue to act to:*

(i) *conserve and enhance the character and appearance of the countryside; and*

(ii) *encourage the considerate use and enjoyment of the countryside by the public. Subject to specific circumstances, particular attention will be paid to:*

a. *the needs of agriculture, woodland planting and management, and other habitat and wildlife conservation;*

b. *the provision of facilities for public access and informal recreation and to enable quiet enjoyment;*

c. *the protection of historic features and their settings; and*

d. *the achievement and conservation of visually attractive landscapes*.'

Policy LL2- Inappropriate rural development also applies and states:

'*The Council will not grant planning permission for development in the countryside unless it is satisfied that the proposal will:*

(i) *respect the character of the landscape; and/or*

(ii) *enhance the appearance of the landscape; and*

(iii) *where appropriate, involve the management of part or all of the remainder of the site to enhance its contribution to the landscape*. '

Policy LL3- Edge of settlement relates to this proposed development on the edge of Harlow and states:

'*The Council will require proposals for development on the edges of settlements to show a sensitive appreciation of their effect upon the landscape by:*

(i) *extensive landscaping; and/or*

(ii) *reduced development densities; and/or*

(iii) *the use of subdued materials and colours; and/or*

(iv) *other techniques aimed at softening or improving their impact*.'

Policy LL13- Highway/ motorway schemes, is particularly relevant to the proposed development and states:

'*The Council will oppose any new, improved or altered highway or motorway proposal unless the associated landscaping scheme (including earth-mounding and planting) will:*

(i) *use appropriate species;*

(ii) *make effective visual screens;*

(iii) *create effective sound barriers; and*

(iv) *adequately replace trees, hedgerows and woodlands which will be lost to the development.*

The Council will seek to ensure that, where feasible, appropriate landscaping will be undertaken prior to the commencement of construction works.'

The provision of new and improved highway infrastructure is accepted but must comply with Policy ST7 – **New roads and extensions or improvements to existing roads** which states:

'*The Council expects schemes for new roads or for extensions and improvements to existing roads to satisfy the following criteria:*

(i) *minimal environmental impact on sensitive areas (including open countryside and its management, sites of wildlife and built heritage interest, and residential areas) with adequate compensatory measures in those cases where environmental losses are unavoidable;*

(ii) *minimal adverse impact on road safety and traffic congestion;*

(iii) *minimal disruption to, or realignment of, the rights of way network; and*

(iv) *the retention of a defensible green boundary and minimal loss of Green Belt land*.'

16. Summary

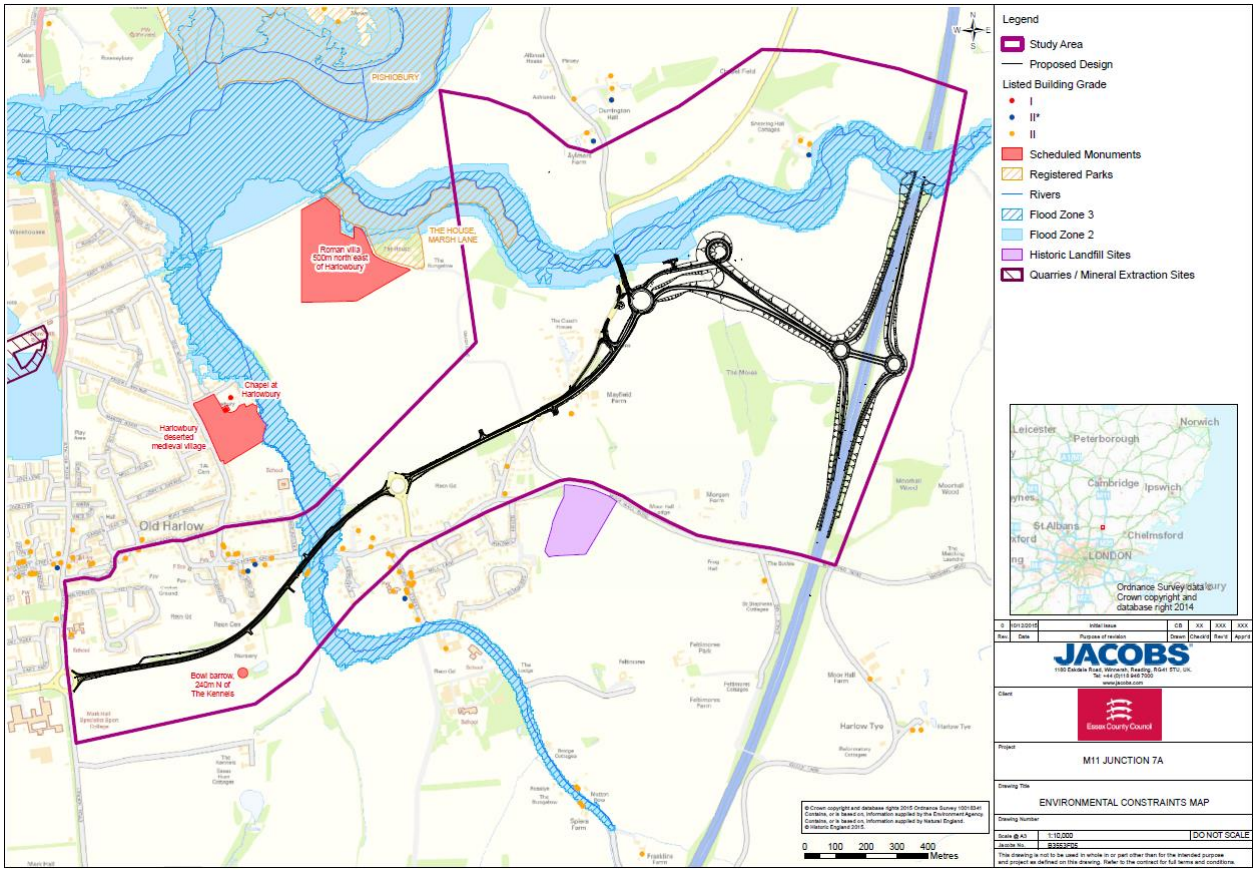
This report provides information to support the formal Environmental assessment Scoping request. It provides in one place the details of the environmental assessment work which will be undertaken, the outline of the Environmental Statement,.

Advice is sought from the Local Planning Authority on the following issue:

- the outline of the Environmental Assessment work and the proposed methodology is appropriate;

Appendices

Appendix A. Environmental Constraints



Appendix B. Harlow County Council Contamination Response

Harlow Council
Working together for Harlow

Ms Lane

Environmental Health

Harlow Council
Civic Centre
The Water Gardens
Harlow
Essex CM20 1WG
www.harlow.gov.uk

Our Ref:
RFI2006281

Your Ref:
Date:09/11/15

Re: Request for Information - Reference Number – RFI2006281 Please quote this reference number if contacting the Council in relation to this matter.

Dear Ms Lane

Thank you for your request for information, which was received on the05/11/15. Your request has been considered under the Freedom of Information Act 2000.

Response

Please find [attached or below] the information you requested.

Contaminated land issues / designations;
None Known

- Historical land uses / general knowledge of the area;
Current use is agricultural

- Pollution incidents;
None Known

- Water abstractions;
No water abstraction for human consumption

- Ground gas and aggressive ground issues;
Gas monitoring and sampling points existed during a 2006 survey in the field to the north of and within 250m of Gilden Way. N548605 E212086 (See next question response)

- Historical and recorded landfills and other waste management facilities;
A pit left after gravel extraction is shown on a 1951 map in the field to the north of and within 250m of Gilden Way. This has since been infilled presumably with domestic refuse. Further information may be available from Essex County Council.

Chief Executive Malcolm Morley • Central Switchboard: 01279 446611 • Email: Contact@harlow.gov.uk

- Environmentally sensitive sites;
The Gibberd Gardens which is just over 250m distance from Gilden Way is a designated Third Tier Wildlife site. N548587 E212247

and
- Any other issues relevant to the environmental setting.
Not specified.

Contact me again if you require any further assistance with your request and I will do my best to provide relevant help and advice.

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If you are dissatisfied with the response you have received and wish to request a review of our decision or make a complaint about how your request has been handled you should write to Contact Harlow at the above address or complete the on-line complaint form that can be found at www.harlow.gov.uk. Your request for an internal review should be submitted to us within 40 working days of receipt by you of this response. Any such request received after this time will only be considered at the discretion of Harlow Council.

If having exhausted the review process you are not content that your request or review has been dealt with correctly, you have a further right of appeal to the Information Commissioner for a decision by writing to the Information Commissioner's Office, Wycliffe House, Water Lane, Wilmslow, Cheshire, SK9 5AF.

Yours sincerely,

Chief Executive Malcolm Morley
Central Switchboard: 01279 446611 • Minicom: 01279 446026

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