

# A509 Isham Bypass



## Environmental Statement

VOLUME 1 - TEXT

AUGUST 2005

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Northamptonshire County Council



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## NON-TECHNICAL SUMMARY

### INTRODUCTION

Northamptonshire County Council is proposing to construct a bypass west of the village of Isham. This section explains the environmental effects of the Scheme in non-technical terms. It is a summary of the full Environmental Statement, which contains detailed information about the likely beneficial and adverse effects of the Scheme on the environment.

### SCHEME OBJECTIVES

The main objectives of the Scheme are:

- ◆ To reduce community severance in the village of Isham by removing through traffic, particularly heavy goods vehicles;
- ◆ To reduce the number and severity of road accidents;
- ◆ To reduce congestion on the A509 particularly during peak hours;
- ◆ To enhance the local environment of Isham and improve conditions for motorists, cyclists and pedestrians;
- ◆ To improve transport links between Kettering and Wellingborough.

### THE PROPOSED SCHEME

The new road would be a dual carriageway 4.3 kilometres long. It would commence at the A14 Pytchley roundabout and run in a southerly direction, west of the village of Isham, and rejoin the A509 Kettering Road midway between Hill Top and Great Harrowden. There would be two roundabout junctions. One would be located at a junction with the existing A509 Kettering road, south of the A14 Pytchley roundabout. The second would be located at a junction with the B574 Hill Top road. All the side-roads would be single carriageway. Lighting would be provided only at the roundabouts.

The Scheme plan shows the locations of the proposed cuttings and embankments. A comprehensive landscape and planting scheme would be provided as part of the Scheme.

### EFFECTS OF THE SCHEME ON THE ENVIRONMENT

#### Land Use

The majority of the study area is under winter wheat, oil seed rape and winter beans, produced in very large fields. One livery enterprise and a pheasant shoot would be affected by the scheme. A total of 38.43 ha of agricultural land would be lost, of which 80% is estimated to be best and most versatile agricultural land. Eight farm enterprises would be affected but none seriously. New field accesses would be provided.

#### Landscape

The Scheme is located within the undulating landform of the Ise Valley, dominated by the towns of Wellingborough and Kettering, and falling within the "Northamptonshire Vales" character area as designated by the Countryside Agency. The local landforms consist of gently rolling clay vales and ridges rising to over 100m above sea level. The Scheme would cross three valleys, against the lie of the land, necessitating embankments of up to 10m in

height and cuttings down to 9m in depth. The Scheme would have a significant adverse impact on the landscape.

The landscape proposals forming part of the Scheme would aim to reflect and enhance the character of the area, through integrating the Scheme with the surrounding landscape, screening unattractive views, retaining as much existing planting as possible and providing a pleasant environment for the road user.

### **Townscape**

The Scheme would benefit the townscape of Isham village by reducing the amount of traffic travelling along the A509 and associated visual impacts on the setting of the buildings bordering the road. It would be largely screened from the village by being in cutting for part of its length.

A number of properties would experience substantial and moderate visual impact in the Scheme's opening year, but this would be reduced in the design year (15 years after implementation) as planting matures.

The lighting of the proposed roundabouts would result in an adverse night-time visual impact but a high standard of lighting technology will be used to keep the impact to a minimum.

### **Biodiversity**

There is one Site of Special Scientific Interest (Southfield Farm Marsh) and one County Wildlife Site (Big Covert) located near the scheme. The SSSI would not be affected by the scheme. Big Covert would be indirectly affected as some of its connections with the local hedgerow network would be lost. Overall, the majority of land affected by the proposed Scheme is arable land of low ecological value. Some hedgerows and trees would be lost but replacements are planned as part of the Scheme.

### **Heritage**

There would be no Scheduled Ancient Monuments, Listed Buildings or Historic Parks and Gardens affected by the proposed scheme. Isham is a designated Conservation Area. The Scheme would provide benefits for this area by reducing traffic noise and improving the visual amenity of the village centre. Isham is an archaeologically rich area, with the Scheme directly affecting five potential archaeological sites. Trial trenching has been undertaken and the need for further archaeological investigations will be further considered prior to scheme construction.

### **Noise**

Overall, the Scheme would have beneficial effects for residents of Isham. It would improve the noise environment for an estimated 40 people (net). Adverse effects on the noise climate have been mitigated by locating the proposed bypass in cutting where it passes closest to the west of Isham and also where it runs closest to properties at Hill Top.

### **Air Quality**

Existing air quality within the study area is generally good. The Scheme would result in an overall improvement in local air quality, with almost 700 properties experiencing an improvement in air quality and just over 100 suffering deterioration. There would be an increase in the emissions of greenhouse gases and regional air quality pollution.

## **Water Environment**

The area around the proposed Scheme is undulating and drained by a number of small streams that flow into the River Ise. Pytchley Brook, Hardwick Brook and an un-named tributary would be traversed by the Scheme. Water quality sampling undertaken at two points on the River Ise indicates a steady improvement between 1998 and 2002. The Scheme does not cross any major floodplains and the effect on the water environment is expected to be minimal. The Scheme includes pollution control measures and balancing ponds to control the flow of water draining from the scheme into nearby watercourses.

## **Local Community**

The existing A509 Kettering Road passes through the village of Isham. The removal of through traffic would provide a safer environment for pedestrian and cyclists, ensuring easier access to residential and commercial premises. Air quality conditions would improve and noise levels in the village would fall as a result of re-routing through traffic onto the bypass.

There would be no provision for pedestrians or cyclists on the new route. The Scheme would not require the demolition of any properties. It would cross four public footpaths and one bridleway. Three overbridges, an underpass and a number of footpath diversions would be provided.

## **Integration**

The scheme would meet regional and local transport planning objectives which support improvements to the existing A509. It would not impact any designated development sites or sites with planning permission.

## **Construction**

Stringent measures would be taken to protect the ecology and the drainage system of the area during the construction phase. Construction traffic would be confined to the main roads and within the site boundary. The spread of dust and dirt would be kept to a minimum by employing appropriate working practises.

## **CONCLUSION**

The Scheme fully supports regional, county and local transport planning objectives. The key benefits of the Scheme are:

- ◆ Reductions in noise and improved air quality for many residents of Isham;
- ◆ Improved safety for pedestrians and a reduction in community severance within Isham;
- ◆ Improved conditions for through traffic.

The Scheme would have some adverse effects, including:

- ◆ Major change to the local landscape;
- ◆ Loss of hedgerows and trees;
- ◆ Increase in noise at a small number of properties;
- ◆ Diversions to Rights of Way.

Significant mitigation measures are proposed to minimise the environmental impact of this scheme.

# 1. INTRODUCTION

## INTRODUCTION

- 1.1 Atkins has a partnership with Northamptonshire County Council to provide highway engineering services within the county of Northamptonshire. The County Council commissioned Atkins to assess a number of route options to determine its preferred route for the A509 Isham Bypass. The A509 Isham Bypass was identified in 2001 as one of two top priority schemes which the County Council would seek to implement during the lifetime of the Local Transport Plan 2006/07 – 2010/11.
- 1.2 The existing A509 Wellingborough Road is a strategic route, running in a north south direction, between A14 Pytchley roundabout south of Kettering and the A509/A510 roundabout, located to the north of Wellingborough. The village of Isham is located on the A509 and suffers from the effects of through traffic. The observed current traffic flows (base year 2002) through the village are approximately 21,300, 12% of which are Heavy Goods Vehicles. The bypass aims to relieve Isham of this through traffic.
- 1.3 The bypass would consist of a dual carriageway which would commence to the south of the A14 Pytchley roundabout, run to the west of Isham and rejoin the A509 Wellingborough Road midway between Hill Top and Great Harrowden.
- 1.4 This Environmental Statement has been prepared to accompany a planning application for the bypass. The planning application will be considered by the County Council's Development Control Committee, following the statutory consultation period. If planning permission is granted, Orders will have to be made under the Highways Act 1980 and the Acquisition of Land Act 1981 before the land can be acquired. In the event of there being objections to the orders, a Public Inquiry will be held.
- 1.5 During the consultation process for the Isham Bypass, concerns were expressed that following implementation of the bypass, problems could still remain on that section of the A509, south of Hill Top and north of the Wellingborough built-up area. In its bid for funding for the Isham bypass, the County Council noted that "further road improvements for the A509 between Isham and Wellingborough would be necessary as part of the longer term strategy. These improvements known as the Isham to Wellingborough Improvement Scheme are being developed as a separate proposal and do not form part of this Environmental Statement.

## BACKGROUND TO THE ENVIRONMENTAL STATEMENT

- 1.6 Environmental Impact Assessment is the process of compiling, evaluating and presenting all the significant environmental effects of a proposed development. The need to undertake an assessment of a proposed road scheme is governed by EU Directives 85/337 and 97/11. The Environmental Statement for the A509 Isham Bypass has been prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 1999 (as amended), which govern the preparation of environmental assessments to accompany planning applications.

- 1.7 The Design Manual for Roads and Bridges (DMRB) Volume 11 – Environmental Assessment is normally used to assess road schemes. The assessment of the Isham Bypass has been carried out in accordance with this document. This entails describing existing environmental conditions and comparing the environmental impacts on each of the specific topics for the following scenarios:
- ◆ Do-Minimum 2009 (Opening Year);
  - ◆ Do-Something 2009 (Opening Year);
  - ◆ Do-Minimum 2024 (Year 15);
  - ◆ Do-Something 2024 (Year 15).
- 1.8 Do-Minimum refers to the network infrastructure and level of demand if construction of the bypass is not considered. The Do-Minimum network will essentially consist of the existing network layout in the base year 2002.
- 1.9 The level of demand in the Do-Minimum will include any committed developments due for completion before the opening or design years, and the predicted background growth between base year 2002, opening and design year. It was assumed that Wellingborough East (WEAST) generated traffic was excluded within the traffic growth forecast and was added to the growthed 2002 base matrix.
- 1.10 Do-Something refers to the network infrastructure and level of demand with the scheme in place, which also includes all changes between the base year and the Do-Minimum. In most cases the level of demand between the Do-Minimum and Do-Something will remain consistent.
- 1.11 GOMMMS “Guidance on the Methodology for Multi- Modal Studies” has previously been used by the government to appraise its major highway schemes and was published by the Department of Transport, Local Government and the Regions in 2000.
- 1.12 In May 2004, the Department for Transport issued its updated technical guidance document for undertaking Environmental Impact Assessments for transport schemes, known as TAG “Transport Analysis Guidance”. In order to be consistent, the Isham Scheme is being appraised in accordance with TAG which incorporates GOMMMS and “Applying the Multi-Modal New Approach to Appraisal of Highway Schemes” which was a ‘bridging document’, between the GOMMMS/TAG approach and the DMRB approach on environmental assessment. Legislative requirements for the undertaking of Environmental Impact Assessments are further detailed in Chapter 6.

#### **AVAILABILITY OF THE ENVIRONMENTAL STATEMENT AND CONTACT DETAILS**

- 1.13 Comment on the draft ES should be addressed to:
- ◆ Stewart L Smith, Atkins Northamptonshire Highways, Riverside House, Riverside Way, Northampton NN1 5AX

## 2. THE PURPOSE OF THE SCHEME

### NEED FOR THE SCHEME

- 2.1 The village of Isham on the A509 suffers from the effects of through traffic. The Hill Top junction and Great Harrowden crossroads have poor accident records. Through Isham, the observed base (2002) daily traffic flows on the A509 are approximately 21,300, 12% of which are Heavy Goods Vehicles. Between Great Harrowden and Wellingborough, which includes the Hill Top junction, observed traffic flows were approximately 26,000 in 2002, 10% of which were HGVs.
- 2.2 TA46/97 provides guidance on opening year Annual Average Daily Traffic (AADT) traffic flows for various carriageway standards. The A509 is classified as an "S2" single carriageway 7.3m road which has a design capacity of up to 13,000 AADT. This section of the A509 is therefore carrying almost twice its design capacity.
- 2.3 Forecast traffic flows were predicted by undertaking a series of traffic counts in 2002 and are shown on Figure 2. Forecast traffic flows were derived from two growth scenarios, which have been developed for 2010 and 2025. Regional Planning Guidance (RPG) is based on traffic growth rates for the East Midlands and Regional Spatial Strategy (RSS) is based on traffic growth rates for the East Midlands. The main difference is the RSS contains significantly higher residential (House) building rates and therefore results in significantly higher traffic forecasts.

### REGIONAL PLANNING GUIDANCE (RPG)

- 2.4 Initially national traffic growth forecasts from the NRTF were determined for High and Low scenarios for 2010 and 2025. The national trip rates were then localised by deriving local trip rates based on employment and housing forecasts in TEMPRO and the Regional Planning Guidance. The national traffic growth rates were factored by the locally derived traffic growth rates to produce a robust traffic growth factor. This growth factor was then applied to the 2002 base trip matrix. It was assumed that Wellingborough East (WEAST) generated traffic was excluded within the traffic growth forecast and was added to the growthed 2002 base matrix.

### REGIONAL SPATIAL STRATEGY (RSS)

- 2.5 Essentially the same methodology was adopted for the RSS forecast traffic demand as for RPG. A growth factor based on employment and housing from the Regional Spatial Strategy was derived and used to factor to the national high and low traffic growth forecasts. The base 2002 demand was factored by the RSS growth factor. It was assumed that WEAST was not included in the housing projections and therefore WEAST generated traffic was added to the factored 2002 traffic demand.

- 2.6 Validation of the 2002 base year model consisted of comparison between observed traffic flows and traffic flows output from the SATURN model. Tables 12.1 to 12.20 show how the modelled flows compared to observed flows and how well they validated, in accordance with criteria from DMRB 12.1, which states that flows across a screenline fall within 15% of observed or have a GEH statistic of less than 4.
- 2.7 High growth traffic flows from the RPG Growth scenario have been shown. The traffic forecasts (high growth) predict that, if no scheme is implemented, 25,600 vehicles would be travelling on the A509 through Isham in 2009 rising to 30,800 vehicles per day in 2024. This means that if no scheme is implemented, traffic flows through Isham village are likely to increase from existing traffic flows (2002) by 20% in 2009 and 45% in 2024.
- 2.8 With the construction of the bypass, the traffic forecasts (assuming high growth) predict that traffic flows on the A509 through Isham village would be reduced to 9,500 vehicles per day in 2009 and 15,700 vehicles per day in 2024. This represents a 63% reduction in traffic flows on the existing A509 in 2009 and a 49% reduction in 2024 compared to the Do Minimum in the same year.
- 2.9 The A509 itself is classified as a Red Route (a route with a high number of accidents resulting in a fatality or serious injury). Northamptonshire Highways Service, working in partnership with Atkins, has implemented traffic calming measures to reduce the number of accidents at this location. These include the enforcement of a 40 mph speed limit and installation of a safety camera. In addition it is considering the possible construction of a roundabout at Great Harrowden, which is subject to funding.
- 2.10 A major mixed-use development is planned for Wellingborough (WEAST). This comprises of approximately 3000 houses, 110 hectares of employment land, which could potentially generate 4000 jobs. This is dependant on what job types can be attracted to Wellingborough, by the end of the Structure Plan period (2016). The WEAST development proposals have not been incorporated into the traffic modelling and it is anticipated that proposals at WEAST would result in 5,000 more vehicles per day. Overall, between 2002 and 2022, there is an anticipated 27% increase of trips predicted for the Wellingborough area, 17% of which would be associated with WEAST. The Sustainable Communities Plan (February 2003) highlights the Milton Keynes and South Midlands area as one of four growth areas. Furthermore, the Milton Keynes South Midlands Sub-Regional Spatial Strategy proposes extensive development to be accommodated in the towns of Corby, Kettering and Wellingborough by 2021.
- 2.11 The Spatial Strategy identifies a number of key infrastructure requirements including the dualling of the A509, between Wellingborough and Kettering, of which the A509 Isham Bypass forms part, to be implemented through the Local Transport Plan by 2011. The A509 is the key transport corridor giving access to and serving the Kettering/Wellingborough area.

## **SCHEME OBJECTIVES**

- 2.12 The objectives of the Scheme are therefore:

- ◆ To reduce community severance currently experienced through the village of Isham by removing through traffic, particularly heavy goods vehicles;
- ◆ To reduce the number and severity of road accidents;
- ◆ To reduce congestion on the A509 particularly during peak hours;
- ◆ To enhance the local environment of Isham and improve conditions for motorists, cyclists and pedestrians;
- ◆ To improve transport links between Kettering and Wellingborough.

### 3. HISTORY OF SCHEME AND ALTERNATIVES CONSIDERED

#### BACKGROUND

- 3.1 A preferred route for the Isham Bypass was chosen by Northamptonshire Planning and Transportation Committee in 1994, after considering eleven options. The preferred route that was chosen ran to the east of Isham. In the mid 1990's preparation work into the preferred route ceased, due to various central government road reviews, notably due to budget pressures.
- 3.2 The Northamptonshire Local Transport Plan which was published in 2000 and covered a five year period between 2000 and 2005, identified the Isham Bypass as one of the 6 top-priority road schemes in Northamptonshire. These 6 top-priority schemes were appraised by Northamptonshire in 2000/2001 with consultation on these schemes in Spring 2001. The County Council Executive decided, in July 2001, that the bypass at Isham was one of two top priority schemes whose implementation should be pursued during the lifetime of the Local Transport Plan. The other Scheme was the A43 Corby Link Road.
- 3.3 It was determined that the top priority schemes would be included in the Council's second Local Transport Plan for 2006/2007 – 2010/2011. The County Council Executive decided that the proposed bypass should be subject to a thorough review of potential route alignments and their impacts, the reasons for this decision being that:
  - ◆ The original decision taken in 1994 was described by the then Director as "a complex issue, since it is necessary to strike a balance between the financial engineering and environmental factors together with the effect on the local communities";
  - ◆ The information on which the decision was taken to include the Isham bypass as a priority scheme was nearly 10 years old and had to be updated, with the assessment following the 'new approach to appraisal' methodology introduced by Central Government.
- 3.4 A Wider Reference Group for the Isham Bypass study was set up in November 2001. This comprised of MPs, Northamptonshire County Councillors, Borough of Wellingborough and Kettering Borough Councillors, Parish Councillors of nearby towns and villages (Burton Latimer, Pytchley, Orlingbury, Finedon, Great Harrowden, Little Harrowden) as well as representatives from local action groups. A full list of all WRG members is included in Appendix D. The remit of this group was to decide on which routes should be taken forward for further assessment and be subject to public consultation.

## ALTERNATIVE ROUTES

- 3.5 Atkins began the preliminary assessment with thirteen route options, included in the brief agreed by the members of the Wider Reference Group in January 2002. These are shown on Figure 4. Routes 1 to 4 were included in the first public consultation exercise in 1992. Routes 5 to 11 were investigated following the public exhibition in 1992 from which a preference was approved by the County Council in 1994. Routes 12 and 13 were suggested by the Ise Valley Protection Group during consultations in June 2001.
- 3.6 Baseline environmental data was collected in order to assist in the sieving of routes. Of the thirteen routes, five (3, 4, 7, 9 and 11) were variations of other routes and it was considered that there was little merit in considering them further in the initial assessment. However, the possibility of reconsidering them at a later stage, should one of their 'parent' routes be selected was not ruled out.
- 3.7 The eight remaining routes (1, 2, 5, 6, 8, 10, 12 and 13) were subject to further assessment as well as to recommend that 'link roads' associated with western routes were dropped.
- 3.8 The Wider Reference Group was consulted in August 2002 regarding these eight routes. Following technical assessment of the eight routes which comprised preliminary environmental, traffic and economic assessments, Atkins recommended that three routes be taken forward to public consultation in mid February. The routes recommended were Routes 2, 5 and 6. These are shown on Figure 5.
- 3.9 Routes 1, 8, 10, 12 and 13 were rejected for a variety of reasons, as follows:
- ◆ Route 1 would not adequately reduce the amount of traffic travelling through Isham;
  - ◆ Route 8 was rejected on traffic grounds as it would only provide 50% traffic relief through Isham village compared with 65% relief in 2007;
  - ◆ Route 10 would not address the accident problem at the Hill Top Road junction of Great Harrowden crossroads, and it might lead to undesirable infill development between the route and the edge of the village envelope;
  - ◆ Route 12 was the least acceptable in terms of its impact on natural resources, nor did it perform as well as other routes in terms of traffic relief. The route was rejected primarily on environmental grounds;
  - ◆ Route 13 was rejected as it would only provide 1% traffic relief to the village of Isham in 2007 and 6% in 2022. It would also have a direct impact on a designated County Wildlife Site located to the west of Finedon;
  - ◆ Routes 1, 8 and 12 were in to close a proximity to the residents of Pytchley and would have had a significant impact on open countryside to the west of Isham.

## ROUTES SELECTED FOR CONSULTATION

- 3.10 Routes 2, 5 and 6 were selected from the eight routes and put forward for public consultation in during Spring 2003.

### Route 2

- 3.11 Route 2 would pass to the west of Isham, commencing at the A14 Pytchley Roundabout and would run southwards to rejoin the A509 Wellingborough Road midway between Hill Top and Great Harrowden (see Figure 5). The length of the bypass would be 4.3km. There would be two at grade roundabout junctions at the junction with the A509 Kettering Road south of the A14 Pytchley Roundabout and at the junction with the B574 Hill Top Road. All the side roads would be single carriageway, totalling 1.63km of the 4.3km total length. The role of the side roads would be to provide access to the village via the existing A509 and to maintain access to the B574. An overbridge would be required to carry Orlingbury Road over the bypass.
- 3.12 There would be extensive earthworks required with this route, with cuttings up to 9m deep and embankments up to 10m high. This route would pass within 30m of properties in Fairfield Road and Winston Road in Isham, in an 8m deep cutting; pass within 80m of Frisby Lodge, in a 7m deep cutting; and within 30m of the nearest property at Hill Top Road.
- 3.13 The road would cross bridleway GW15, footpaths, GW2, TM3, TM4 and TK18 and would cross two tributaries of the River Ise. The aim is to divert rights of way GW15 and GW2 to a combined culvert and underpass at the northern tributary of the River Ise. Footpath TM3 could be diverted to a combined culvert and underpass at the southern tributary or alternatively a pedestrian overbridge could be constructed. Footpath TK18 could be diverted along Hill Top Road or alternatively a pedestrian overbridge could be constructed. The rights of way are shown on Figure 7. Provisions for the rights of way would be considered further once the preferred route is chosen.
- 3.14 The cost of this route was then estimated at £10.314m (discounted 1998 costs excluding inflation, risk analysis, optimism bias).

### Route 5

- 3.15 Route 5 would pass to the east of Isham commencing at the A14 Pytchley Roundabout and leading to the junction with Northen Way and Stewarts Road in Wellingborough. The road would be 6.5 km in length (see Figure 5). A single carriageway would link through to Northen Way and all side roads would be single carriageway. At grade roundabouts would be constructed at the junction with Burton Latimer Station Road; the junction with Finedon Station Road; and the junction with the proposed extension of Northen Way. Overbridges would be required at Furnace Lane and 'The Slips', (road leading to Great Harrowden Lodge). The side roads would enable access to be maintained where appropriate onto the existing A509 and Burton Latimer Station Road.

- 3.16 This was the longest of the three routes and would involve cuttings up to 6m deep and embankments up to 7m in height. The route would pass within 85m of "Ranley" Burton Latimer Station Road, at grade and within 55m of No's 15 and 17 Mill Lane Isham, on a 2m embankment possibly screened by an earthworks bund. The route would pass within 45m of Station Farm, Finedon Station Road generally at grade. The route would pass within 20m of 23 Furnace Lane and 30m of "The Bungalow" Furnace Lane, in a 3m cutting.
- 3.17 The road would cross footpaths TM10, TM11 and TM6. The road would cross two tributaries of the River Ise and two ditches adjacent to Isham Mill. Right of way TM10 could be diverted via the old A509 and Burton Latimer Station Road. A pedestrian overbridge could be provided where the route crosses right of way TM11 and right of way TM6 could be diverted to this overbridge. Provisions for the rights of way would be considered further once the preferred route is chosen.
- 3.18 The cost of this route was then estimated at £15.897m (discounted 1998 costs excluding inflation, risk analysis, optimism bias).

### **Route 6**

- 3.19 Route 6 would run to the east of Isham from the A14 Pytchley roundabout to the A509 Wellingborough Road midway between Finedon Station Road and Furnace Lane. The length of Route 6 would be 3.8km. The road would be single carriageway from Finedon Station Road to tie in with A509 Wellingborough Road. All side roads would be single carriageway, totalling 1.27km. There would be at grade roundabouts at the junction with Burton Latimer Station Road and at the junction with Finedon Station Road. The role of the side roads would be to enable access to the A509 where appropriate and Burton Latimer Station Road.
- 3.20 There would be less extensive earthworks associated with this route, compared to the other two routes, though some cuttings would be up to 8m deep and embankments up to 7m in height. The route would pass within 85m of "Ranley" Burton Latimer Station Road, at grade and within 55m of No's 15 and 17 Mill Lane Isham, on a 2m embankment possibly screened by an earthworks bund.
- 3.21 The road would cross footpaths TM10, TM11 and TM6. The road would cross two tributaries of the River Ise and two ditches adjacent to Isham Mill. Right of way TM10 could be diverted via the old A509 and Burton Latimer Station Road. A pedestrian overbridge could be provided where the route crosses right of way TM11 and right of way TM6 could be diverted to this overbridge. Provision for the rights of way would be considered further once the preferred route is chosen.
- 3.22 The cost of this route was then estimated at £10.667m (discounted 1998 costs excluding inflation, risk analysis, optimism bias).

### **Reasons for the Rejection of Alternative Routes 5 and 6**

- 3.23 82% of the consultation questionnaires returned supported the idea of an Isham Bypass, with 62% supporting the preferred route, 34% Route 5 and 4% Route 6.

- 3.24 There has been an increasing awareness of environment issues since the original preferred route was chosen in 1994. In particular flooding and both Routes 5 and 6 pass through the river Ise flood plane. The views of the Environment Agency require significant consideration and they had a preference for Route 2 on the grounds that the other routes involve development within the floodplain of the River Ise. The environmental aspects of the route options were assessed and on balance the preferred alternative on environmental grounds was route 2.
- 3.25 From an engineering perspective all the routes are buildable with large earthworks associated with all due to the undulating topography of the land. Route 2 has the advantage of not being constructed in the floodplain where additional flood measures would be required.
- 3.26 Transportation aspects including traffic modelling, cost benefit analysis and accident savings were assessed. Route 2 showed the most beneficial cost benefit ratios, best accident savings and good traffic relief.

### **PREFERRED OPTION**

- 3.27 A Stage II Environmental Appraisal Report was compiled in July 2003 and concluded that Route 2 presented 'no insuperable environmental difficulties and would be the preferred route on environmental grounds'. In May 2003 the County Council Executive formally announced the preferred route for the Isham Bypass. Following a submission from the County Council to Central Government, provisional acceptance and financial approval was received in December 2003. The preferred option, Route 2 has been further developed and is therefore the subject of this Environmental Statement (Figure 18).

### **Do-MINIMUM OPTION**

- 3.28 As stated in Paragraph 1.8 the Do-Minimum refers to the existing network layout in the base year 2002.
- 3.29 The level of demand in the Do-Minimum will include any committed developments due for completion before the opening or design years, and the predicted background growth between base year 2002, opening and design year. Traffic flows forecasted for the Do-Minimum 2024 have indicated a significant increase in traffic on this network, which currently experiences traffic flows much greater than the network was designed to accommodate. This would have significant adverse impacts on the local environment in Isham. Noise levels would increase and community severance currently experienced would become much worse. This would have adverse impacts for pedestrians and cyclists movement within the village and the conservation area status of Isham.

## 4. SCHEME DESCRIPTION

### LOCATION AND DESCRIPTION OF THE SCHEME

- 4.1 The route for the Isham bypass lies within a route corridor between the towns of Kettering in the north and Wellingborough in the south. The existing A509 road, which passes through the village of Isham, provides an important north/south route connecting the A14 and A45 Trunk Road serving Kettering and Wellingborough and destinations towards the southwest.
- 4.2 The study area is of undulating terrain consisting of mainly arable and pasture land with some small areas of woodland. The River Ise runs to the east of Isham village and east of the Midland Mainline railway. Altitudes within the study area range from around 50m on the Ise floodplain valley to around 90m on the high ground west of Isham.
- 4.3 The route (Figure 18) passes to the west of Isham, commencing at the A14 Pytchley Roundabout and would run southwards to rejoin the A509 Wellingborough Road midway between Hill Top and Great Harrowden. The length of the bypass would be 4.3km. There would be two at grade roundabout junctions at the junction with the A509 Kettering Road south of the A14 Pytchley Roundabout and at the junction with the B574 Hill Top Road. Northwards from the roundabout at Hill Top the bypass would be dual carriageway standard and single carriageway southwards to connect with the existing A509. All the side roads would be single carriageway. The role of the side roads would be to provide access to the village of Isham via the existing A509 and to maintain access to the B574. An overbridge would be provided to carry Orlingbury Road over the bypass.
- 4.4 Extensive earthworks would be required, with cuttings up to a maximum of 9m deep and embankments up to a maximum of 10m high. The route would pass within 30m of properties in Fairfield Road and Winston Road in Isham, in an 8m deep cutting; pass within 80m of Frisby Lodge, in a 7m deep cutting; and within 30m of the nearest property at Hill Top Road.
- 4.5 Street lighting would be installed at the two roundabout junctions. Flat glass 'cut off' lanterns would be used to reduce light 'spill' to the night sky and night time visual impact.
- 4.6 Lay-bys would be constructed to the north and south of the Kettering Road roundabout.
- 4.7 The road would cross bridleway GW15, footpaths, GW2, TM3, TM4 and TK18. The rights of way GW15 and GW2 would be combined to cross beneath the bypass in a combined footpath underpass and culvert for Pytchley Brook. A further bridleway diversion would provide a link from bridleway and footpaths GW2/15 and TM3 to an overbridge at The Ruts, north west of Fairfield Road. Footpath TM4 would be diverted over the new overbridge at Orlingbury Road. Footpath TK18/TM5 would be diverted to an overbridge crossing the bypass just west of Ashpole Plantation. A further footbridge would be provided south of the Hill Top roundabout to allow pedestrians, cyclists and equestrians to cross in safety.

- 4.8 The route crosses three watercourses which drain into the River Ise. These are Pytchley Brook, Hardwick Brook and an unnamed watercourse to be referred to as 'Little Harrowden Brook'. New culverts would be constructed at Pytchley and Hardwick Brooks and the existing pipe extended for the 'Little Harrowden Brook'. Balancing ponds would be constructed, to control the discharge rate of highway drainage, at each of the watercourses.
- 4.9 The detailed design of structures has yet to be finalised. Options for the watercourse crossings include corrugated pipe arch culverts or reinforced concrete box culverts. The Orlingbury Road bridge could be of reinforced concrete or steel beam construction, while the footbridge is likely to be of steel truss construction. (See figures 32 – 35)
- 4.10 The design life, with appropriate maintenance, for the road pavement is 40 years and for structures 120 years

## 5. TRAFFIC FLOWS

### EXISTING CONDITIONS

- 5.1 Existing traffic flows were observed for 2002 on the major roads and corridors within the A509 Isham Bypass study area and are shown on Figure 2.
- 5.2 The 24 hour two-way traffic flows shown on the major corridors within the study area, A509, A6, A510 and local distributor road within Burton Latimer were derived from Manual Classified Counts (MCC) undertaken at Roadside Interview Sites.
- 5.3 The 2002 observed traffic flow on the A509, south of Great Harrowden, was an annual average weekday traffic (AAWT) flow of 26,000 vehicles per day (two-way), with 23,000 vehicles per day (two-way) for an annual average daily traffic (AADT) flow. The percentage of Heavy Goods Vehicles (HGVs) on the A509 south of Great Harrowden was 10%.
- 5.4 The 2002 observed traffic flow on the A6, north of Finedon, was an AAWT flow of 17,000 vehicles per day (two-way), with an AADT of 15,000 vehicles per day (two-way). The percentage of Heavy Goods Vehicles (HGVs) on the A6 north of Finedon was 8%.
- 5.5 The 2002 observed traffic flow on the A510, South of A14, was an AAWT flow of 6,000 vehicles per day (two-way), with an AADT of 5,000 vehicles per day (two-way). The percentage of Heavy Goods Vehicles (HGVs) on the A510 south of A14 was 11%.
- 5.6 The 2002 observed traffic flow on the C4 (unclassified) Finedon Rd, Burton Latimer, was an AAWT flow of 5,000 vehicles per day (two-way), with an AADT of 4,000 vehicles per day (two-way). The percentage of Heavy Goods Vehicles (HGVs) on the C4 was 4%.

### TRAFFIC MODEL

- 5.7 The forecast traffic flows used in the economic appraisal were based on traffic flows taken from a traffic assignment model suite of programs, SATURN. The 2002 base year traffic flows used in the SATURN model were derived from four RSI surveys undertaken in April 2002, with additional count data provided by Northamptonshire County Council's traffic monitoring programme.
- 5.8 To validate the observed traffic flows on the day of survey, Automatic Traffic Counts (ATC) were undertaken for a two week period, one week prior to week of survey and during the week of survey. Comparisons were also made with data collected as part of NCC's traffic monitoring programme.
- 5.9 Three time periods have been modelled, representing the morning and evening peaks and an off peak period representing the inter-peak. Two user classes, Cars/Light Goods Vehicles and HGVs have been modelled as a combined all vehicle matrix. Forecast year traffic flows were produced for an opening year 2009 and a design year of 2024 and are shown diagrammatically on Figure 2.

- 5.10 Forecast traffic flows were derived from two growth scenarios, which have been developed for 2010 and 2025. Regional Planning Guidance (RPG) is based on traffic growth rates for the East Midlands and Regional Spatial Strategy (RSS) is based on traffic growth rates for the East Midlands. The main difference is the RSS contains significantly higher residential (House) building rates and therefore results in significantly higher traffic forecasts.

## **6. METHODOLOGY FOR ENVIRONMENTAL ASSESSMENT**

### **INTRODUCTION**

- 6.1 This Environmental Statement presents the assessment of the environmental impacts likely to result from the construction and operation of the Isham Bypass. This chapter outlines the general background to Environmental Impact Assessment legislative requirements and refers to the general methodology used to assess the various environmental topics.

### **ENVIRONMENTAL IMPACT ASSESSMENT LEGISLATIVE REQUIREMENTS**

- 6.2 The need to undertake environmental assessments is governed by European and UK legislation.
- 6.3 The EC directive 85/337/EEC on “The assessment of the effects of certain public and private projects in the environment” came into effect in July 1988 and initiated a formal approach to environmental assessment throughout the European Community. The Directive required an environmental assessment to be carried out, prior to a development consent being granted, for certain types of major projects judged likely to have significant impacts on the environment.
- 6.4 In March 1997, European Directive 85/337/EEC was amended by Directive 97/11/EC. The 97/11 extended the list of projects which are considered to have significant effects on the environment, and provided selection criteria to determine whether projects for which assessment is not mandatory, should require an environmental assessment. It also permits individual Member States to set their own criteria. A further important Article in the Directive is Article 5(3) which requires developers to provide an outline of alternatives which have been considered and an indication of the main reasons for the choice, taking into account environmental effects.
- 6.5 Annexes to Directive 97/11 EEC identify classes of project where Article 4 determines that assessment is either mandatory (Annex I) or discretionary (Annex II). Roads falling into Annex I are
- ◆ Motorways and express roads;
  - ◆ New roads of four or more lanes, or realignment and/or widening of an existing road of two lanes or less so as to provide four or more lanes, where such new roads, or realigned and/or widened sections of roads would be 10km or more in a continuous length.
- 6.6 Other road schemes are included in Annex II. The Isham Bypass would be an Annex II project. Member States may set criteria or thresholds to determine whether an Annex II project should be subjected to an environmental assessment. Schemes with a land take of more than 1 hectare are normally subjected to environmental assessment, in accordance with the Regulations.

- 6.7 Directive 85/337/EEC and the amended 97/11/EC Directive were implemented through the UK through the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, (as amended) and by the Highways (Assessment of Environmental Effects) Regulations 1999. The latter is applicable to trunk road schemes promoted by the Highways Agency. Guidance on the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 is outlined in Circular 02/99.

### **OBJECTIVES OF THE ENVIRONMENTAL ASSESSMENT**

- 6.8 Environmental Impact Assessment is the process of compiling, evaluating and presenting all the significant environmental affects of a proposed development. The assessment process is designed to help produce an environmentally sensitive scheme. This can be achieved by early detection of potentially significant adverse environmental impacts which can enable the Scheme to be amended or appropriate mitigation measures to be built into the final design.
- 6.9 This assessment has been carried out in accordance with the guidance given in the Design Manual for Roads and Bridges Volume 11 – Environmental Assessment. It details the four principal objectives of an ES as follows:
- ◆ To describe the proposal, the local environment and the existing conditions;
  - ◆ To identify and evaluate the potential impacts of the proposal both during the construction and operational phases of the proposal;
  - ◆ To propose mitigation measures and identify residual impacts both during the construction and operational phases;
  - ◆ To communicate the results to decision makers and other interested parties.
- 6.10 An outline of the main alternatives has also been considered, indicating the main reasons for their rejection. These are included in Chapter 3.

### **THE STRUCTURE OF THE ENVIRONMENTAL STATEMENT**

- 6.11 The Environmental Impact Statement for the Isham Bypass comprises the following volumes:
- ◆ Non Technical Summary – A brief report summarising the principal sections of Volume 1 of the ES in non-technical language which is readily understandable by members of the public. A copy is included at the beginning of this volume;
  - ◆ Volume 1 - A comprehensive and concise document drawing together all the relevant information about the scheme;
  - ◆ Volume 2 - Illustrations;
  - ◆ Volume 3 - A volume containing detailed technical information relating to each of the environmental topics assessed, as well as other appendices.

## **PUBLIC CONSULTATION EXERCISES**

6.12 Public consultation was undertaken on a shortlist of routes in July 2003 and environmental issues were addressed as part of this exercise. In November 2003 and August 2004 a Scoping Report was distributed to members of the Wider Reference Group and planning officers in Northamptonshire County Council, Borough Council of Wellingborough and Kettering Borough Council. The Department for Built and Natural Environment in Northamptonshire County Council and Environmental Health Officers at the aforementioned Borough Councils were also contacted. A list detailing members of the WRG is included in Appendix D. The following organisations were also consulted. Their responses are included in Appendix L.

- ◆ English Heritage;
- ◆ Countryside Agency;
- ◆ Environment Agency;
- ◆ English Nature;
- ◆ Highways Agency;
- ◆ DEFRA;
- ◆ Wildlife Trust.

## **SCOPE OF THE ASSESSMENT**

6.13 In order to meet the Government's environmental objective for transport, the A509 Isham bypass needs to be appraised against a number of sub-objectives outlined in DMRB/TAG dealing with the impact of the proposal on both the built and natural environment and on people.

6.14 The Scoping Report identified the major environmental issues, relating to both the construction and operational phases of the scheme. It set out the proposed structure and content of the Environmental Statement, including requirements for consultation. The Scoping Report aimed to:

- ◆ Review the subject matter and scope of the environmental assessment;
- ◆ Review existing data collected and define the scope and methodology for the collection of additional data, against which potential changes could be assessed;
- ◆ Highlight additional issues which may be significant for the compilation of a comprehensive Environmental Statement.

6.15 The Scoping Report concluded that the following topics should be considered in more detail:

- ◆ Land Use;
- ◆ Landscape & Townscape;
- ◆ Biodiversity;
- ◆ Heritage of Historic Resources;
- ◆ Noise;
- ◆ Air Quality;
- ◆ Water Environment;
- ◆ Accessibility;
- ◆ Physical Fitness and Journey Ambience;

- ◆ Integration;
- ◆ Cumulative Effects;
- ◆ Impacts during Construction.

### **ENVIRONMENTAL ASSESSMENT GENERAL METHODOLOGY**

- 6.16 The Environmental Assessment has been undertaken in accordance with DMRB Volume 11, supplemented by current best practice. Each chapter in the ES refers to one of the above-mentioned topics. The structure of each covers the following :
- ◆ Introduction
  - ◆ Method of assessment
  - ◆ Criteria for significance of impact
  - ◆ Baseline conditions
  - ◆ Impact during construction
  - ◆ Mitigation measures during construction
  - ◆ Impact when operational
  - ◆ Mitigation measures when operational
  - ◆ Summary
- 6.17 Each chapter sets out the basis of the assessment method adopted and refers to the relevant section of DMRB Volume 11. To assess the criteria for significance, each topic follows general guidelines set out in DMRB. A detailed overview of the baseline conditions has been given for each individual topic, using various methods including literature research, desktop reviews of previous reports and studies, site visits/investigations and consultation exercises. Various surveys have also been undertaken to inform existing conditions and assess the environmental impact of the scheme. This work was mainly carried out during 2003/2004. The surveys are detailed in the relevant topic chapters.
- 6.18 Impacts during the construction and operation phase have been assessed and mitigation measures proposed for each phase. Mitigation measures have been designed into the Scheme for each of the relevant topics. These will secure environmental benefits and ensure good environmental design. The general approach aims to optimise beneficial effects and avoid, reduce or remedy and compensate for new adverse effects.
- 6.19 At the end of each chapter a summary is given for each topic which brings together the significant impacts which need to be considered in the statutory decision making process. Chapters 8 to 18 details the effects of the range of topics on the local environment. Chapter 19 draws together the impacts during construction for all the environmental topics.

## 7. THE STUDY AREA

### INTRODUCTION

- 7.1 This chapter provides a brief overview of the location and nature of the Isham study area including key land uses, topography, drainage and the local environment. Figure 7 illustrates the environmental resources within the study area.

### LOCATION AND TOPOGRAPHY

- 7.2 The route corridor for the Isham bypass lies within a route corridor between the towns of Kettering in the north and Wellingborough in the south (see Figure 1). The approximate boundaries of the Isham study area are the A14 Pytchley roundabout to the north, the villages of Pytchley, Orlingbury, Great Harrowden and Little Harrowden to the west, the A510 to the south and the Midland railway line to the east. The settlements of Burton Latimer and Finedon have also been considered in this assessment. The A509 road which runs through the village of Isham currently provides an important north/south route connecting Kettering and Wellingborough via the A14 Pytchley roundabout.
- 7.3 The study area is of undulating terrain consisting of mainly arable and pasture land with some small areas of woodland. Land rises southwards from Isham towards Hill Top before falling away towards Wellingborough. The River Ise runs to the east of Isham village. The floodplain associated with the River Ise primarily covers land to the east of the railway line, which runs along the length of the valley, and also land to the west of the railway just north of Isham. Altitudes within the study area range from around 50m on the Ise floodplain valley to around 90m on the high ground west of Isham. The topography of the area is characterised by moderate slopes on valley sides, rising to broad, gently rolling interfluvies. The Ise valley is a broad depression with a floodplain that is up to half a kilometre wide.

### DRAINAGE PATTERN

- 7.4 The land around Isham is drained by a number of small streams that flow into the southward flowing River Ise (see Figure 7). Between the A14 to the north and Wellingborough to the south, the River Ise receives 4 major tributaries from the west. From north to south these are: Pytchley Brook; Hardwick Brook; an un-named watercourse flowing south of the village of Little Harrowden; and Harrowden Brook. Several unnamed watercourses are located to the east of the River Ise. The most northerly of these flows around the south side of Burton Latimer. Another significant tributary flows from the village of Finedon, whilst a third flows along the A510 corridor from the south of Finedon to Wellingborough. There are also various drains on both sides of the River Ise that drain the flatter areas of the floodplain.
- 7.5 In terms of hydrogeology, the bypass would pass over predominantly Northampton Sand and limestone in the Upper Estuarine Series.

## **LAND USE AND SETTLEMENT**

- 7.6 The two main towns of Kettering and Wellingborough are to the north and south of the study area respectively, joined by the A509. The town of Burton Latimer is located to the east of the Midland Main Line railway. To the west of the railway there are a number of villages, notably Isham village which straddles the A509 as well as the villages of Pytchley, Orlingbury, Little Harrowden and Great Harrowden. The large village of Finedon is located to the east of the railway line, south east of Burton Latimer. The area to the north and west of Finedon, east of the railway line has been extensively mined for ironstone in the recent past but the land has been largely restored. Other significant ironstone activity in the study area was to the north of Burton Latimer and east of the railway.
- 7.7 There is an existing transport network surrounding the study area comprising of the A14 to the north, the A510 to the south and south east and the A6 which runs to the east of Burton Latimer and Finedon. The Midland Main Line railway line runs through the east of the study area connecting London St. Pancras to Nottingham and Sheffield. There are overhead power lines within the study area which run north to south to the west of Orlingbury.
- 7.8 The great majority of the study area, apart from the Ise floodplain, is arable land under winter wheat, oil seed rape and winter beans, produced in very large fields. The Ise Valley is of poorer agricultural land quality and its visual attractiveness is affected by sporadic industrial development. To the north east of Burton Latimer, is the Weetabix factory, a landmark of the River Ise Valley. There are further industrial developments east of the railway line at Furnace Cottages and also along Furnace Lane. A golf course and driving range is located immediately south west of the A14 Pytchley roundabout. A second one is located in the grounds of Great Harrowden Hall, a Grade 1 Listed Building. Parts of the grounds of the Hall are included in the Register of Parks and Gardens of Special Historic Interest in England.
- 7.9 The Wellingborough East Strategic Development Area (WEAST) is located primarily to the east of the railway, to the south east of Finedon Road Industrial Estate. The adopted Northamptonshire County Structure Plan proposes 3,000 housing units and 110ha of employment uses for the Wellingborough East Area. 56ha of green leisure use is also proposed as part of WEAST as well as a new Eastern Distributor Road linking the A45 with the A510. To the north east of Finedon Road Industrial Estate is an area of land allocated for employment use in the Wellingborough Local Plan. This area has planning permission for employment use. The area known as the former Isham scrap yard, to the north of the village of Isham, has also been granted planning permission for employment use.
- 7.10 The area of land between Wellingborough and Great Harrowden is designated as an area of restraint, intended to prevent the coalescence of settlements and to retain the open and rural character of the countryside.

**LOCAL ENVIRONMENT**

- 7.11 The centre of the village of Isham is designated as a Conservation Area. Parts of the villages of Burton Latimer, Pytchley and Finedon are also designated as Conservation Areas. There are no Scheduled Ancient Monuments within the study area but there are a number of listed buildings in Isham, Finedon and Pytchley. Great Harrowden Hall and its formal gardens are Grade I listed. The grounds of Great Harrowden Hall, which include a golf course, are included in the Register of Historic Parks and Gardens.
- 7.12 Orlingbury Hall, in the village of Orlingbury is also designated as a Grade II\* listed building and Finedon Hall, in the village of Finedon, is designated as a Grade II listed building.
- 7.13 There are areas of marshland along the River Ise Valley particularly adjacent to Isham Mill, which are of wildlife interest. To the southwest of Burton Latimer lies Burton Latimer Pocket Park, east of the railway. This is adjacent to Burton Latimer Meadows and Hog's Hole both which are designated as Northamptonshire Wildlife Trust Prime Sites or County Wildlife Sites (CWS). Additional County Wildlife Sites located in the study area include Big Covert CWS, which is mature woodland adjacent to a meandering tributary of the River Ise; Finedon Sidings CWS; Finedon Cally Banks CWS and Finedon Disused Railway. The last two sites are contiguous sites that make up Finedon Pocket Park, which is a Northamptonshire Wildlife Trust Reserve.
- 7.14 There is one Site of Special Scientific Interest, South Field Farm Marsh SSSI, located within the study area. This site has already been reduced in size by the construction of the A14 and would not be affected by the proposed Isham Bypass.
- 7.15 The majority of agricultural land is classified as Grade 2 or 3 i.e. the best and most versatile category which has a certain degree of planning policy protection afforded to it. There are pockets of poorer quality agricultural land (Grade 4) along the River Ise Valley.
- 7.16 There is a network of footpaths and bridleways which traverse the study area linking the towns to the rural areas (Figure 7). The footpath off Mill Lane links Isham and Burton Latimer via a footbridge over the railway and is regarded by the residents of Burton Latimer and Isham and by Kettering Borough Council as a well used, important footpath link. Footpaths TM3, GW15 and GW2 link Isham and Pytchley and footpath TM10 links Burton Latimer and Pytchley via Isham. There are a number of other footpaths in the study area which provide an important network west of Isham linking other built up areas, including villages, to the open countryside. Right of way TK20 links Furnace Lane to the A509 at its junction with the A574 Hill Top Road to Little Harrowden. Footpath TK18 links the B574 to the A509 just south of Isham village. Footpath TM4 links Isham to the Springfield Farm and Orlingbury Road. Footpath TM6 provides a link between Isham and Finedon Station Road. There are a number of other footpaths within the study area that link the villages of Pytchley, Orlingbury, Little Harrowden and Great Harrowden.
- 7.17 Further information on baseline environmental conditions within the study area can be found in the relevant topic chapters of this report.

## 8. LAND USE

### INTRODUCTION

- 8.1 Most of the land affected by the Isham Bypass is in agricultural use. This section assesses the potential impact on agricultural resources and existing farming enterprises, during the construction and operational phases. These effects are assessed with and without recommended mitigation measures being implemented. It has been assumed that the agricultural circumstances prevailing at the time of survey will continue to prevail. This chapter also considers potential impacts on other land uses (existing and potential).

### METHOD OF ASSESSMENT

- 8.2 PPS7 Sustainable Development in Rural Areas states that the best and most versatile land (Grades 1, 2 and 3A) should be taken into account alongside other sustainability considerations, when determining planning applications. Local planning authorities should seek to use areas of poorer quality land in preference to that of higher quality, except where this would be inconsistent with other sustainability considerations. It further states that it is at the discretion of local planning authorities to decide whether best and most versatile agricultural land can be developed.
- 8.3 TAG has not been adapted to include impacts on agricultural land use. This assessment has followed the DMRB Volume 11 Guidelines for a Stage 3 Environmental Assessment, referring to the study of client-supplied data and original survey work. The impact of the bypass on agricultural land use has been assessed both during the construction and operational phase. Reference has been made to impacts both with and without mitigation measures.
- 8.4 The general method of assessment is summarised as follows:
- ◆ Land-Take: This is assessed in terms of quantity and quality. The losses are evaluated against national and local criteria;
  - ◆ Soils: The workability of topsoils and their suitability for reinstatement are described. Effects are assessed assuming good working practice is followed;
  - ◆ Farming practice: The methods of working of individual farms are described, and the impact of the proposals assessed. Alternative methods of working are also examined. Losses, in terms of cropping, and increased time to travel to remaining land parcels are described;
  - ◆ Access: The effects on access and egress from farms and internally within units is described;
  - ◆ Economic impacts: Broad economic impacts are also assessed. Comparative assessments have been made to evaluate the order of magnitude of the impact. These are for comparative assessment purposes only, using standardised data, and do not necessarily reflect accurately the potential financial losses on each farm. The purpose of this assessment is to indicate the severity of impact and not to evaluate levels of compensation payable;

- ◆ Other effects: These include drainage, prospects for farm-based diversification, sporting and other interests.
- 8.5 The four main areas reviewed in any assessment of the effects of a new road on agricultural land are:
- ◆ Land take in relation to quality and quantity of agricultural land lost;
  - ◆ Type of husbandry;
  - ◆ Severance;
  - ◆ Major accommodation works.
- 8.6 Prior to conducting field surveys, published and unpublished data and route plans were consulted. These included land referencing data, route proposals, proposed mitigation measures for landscape, nature conservation and other landscape purposes. Information collected as part of the Stage 2 assessment, was also referred to, including interviews with farmers. National policy guidance, maps of soil and land quality, agricultural statistics and other relevant data was also referred to.

### CRITERIA FOR SIGNIFICANCE OF IMPACT

- 8.7 Impacts which occur during the construction stage, but which can also be defined as long-term impacts include severance, water provision and drainage. Table 8.1 defines the category under which the major effects have been described.

**Table 8.1: Evaluation of Impacts**

Construction Phase	Operational Phase
Disturbance to soils and land for reinstatement	Amount and quality of land taken
Construction severance	Farm size and viability
Loss of buildings	Loss of buildings
Crop losses and timing	Severance
Disease transmission	Land use and farm workability
Field drainage	Access
Recreational Interests	Field drainage
Working camps, dumps etc	Recreational and amenity

- 8.8 Severance during construction may include closure of tracks and gateways or loss of access between the affected land parcels and other areas farmed. The scale of impact used in this assessment is shown in Table 8.2.

**Table 8.2: Significance of impacts for agricultural land**

Insignificant	No impairment to use of land
Minor	Minor disturbance only
Moderate, localised	Some limitation to use of single field or small proportion of farm
Moderate, farm wide	Some limitations to use of more than one field or substantial proportion of farm
Major, localised	Major limitation to use or land inaccessible without mitigation: single fields or small proportion of farm
Major, farm wide	Major limitation to use or land inaccessible without mitigation: more than one field or small proportion of farm

8.9 In addition, each affected holding has been assessed to determine the cumulative effects of land loss, severance and disruption to management. All impacts apart from landtake can be mitigated. Overall impacts on the agricultural enterprise are assessed both with and without the proposed mitigation, so in most cases the main long term impact is that resulting from loss of land and disruption due to the division of the farm by the road.

8.10 Impacts are graded on a scale from insignificant to major, as shown in Table 8.3.

**Table 8.3: Significance of impacts for farms**

Insignificant	The farm will experience only minor disruption, or a decrease in land area and/or potential profitability of less than 2%
Minor	Land loss or disruption to the farm will affect the land area and/or the potential profitability of the holding by 2% - 5%
Moderate	Land loss or disruption to the farm will affect the land area and/or potential profitability of the holding by 5 -10%.
Major	There will be severe disruption to farming practice and the way the farm is managed. Land area and/or profitability will be reduced by more than 10%.

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## BASELINE CONDITIONS

- 8.11 Surveys of the land affected by the route corridor were undertaken in September and October 2003. These comprised:
- ◆ Assessment of soils: A qualified and experienced soil surveyor reviewed published soil information and related this information to DEFRA (formerly MF) guidelines for agricultural land classification.
  - ◆ Interviews: All occupiers and most landowners or their agents were interviewed individually to obtain baseline data about each holding, the size and location of the units, enterprise type and methods of husbandry and management. Information was gathered on water supply, field drains and access.
  - ◆ Route examination: Either during or after interviews, the route was examined in order to verify details discussed at the interview, and to examine land use and condition.
  - ◆ Agri-Environmental Grant Schemes: Statutory bodies were contacted and confirmed that there is no land within an Environmentally Sensitive Area or affected by the Countryside Stewardship Schemes.
- 8.12 Baseline conditions can be divided into two categories; inherent conditions and existing land use due to human impact.

## Geology and Relief

- 8.13 The study area is underlain by Inferior Oolite and Lias sediments of Jurassic age. Hard ferruginous sandstone (ironstone) caps the high ground, with interbedded limestones, sands and clays outcropping on the valley sides. Altitudes range from 55m AOD on valley floors to 90m AOD on the high ground west of Isham. The topography of the area is characterised by moderate slopes on valley sides, rising to broad, gently rolling interfluves.

## Climate

- 8.14 The climate is typical of much of the East Midlands with around 600 mm of rainfall and a field capacity period (when soils are replete with water) of around 125 days.

## Soils

- 8.15 The only published soil map of the district is the 1:250,000 Soil Map of England and Wales (Midland and Western England) and the accompanying book 'Soils and their Use in Midland and Western England'. This identifies four soil associations in the study area, in addition to the disturbed soils of the old ironstone workings. On high ground there are brashy, well drained Banbury soils developed in Ironstone; on the valley sides there are the very variable Morton association on outcrops of clays, limestones and loamy deposits, passing down slope to very heavy, wet Denchworth soils where Lias clay outcrops.

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### Agricultural land classification

- 8.16 Agricultural land quality in England and Wales is expressed by the system of Agricultural Land Classification (ALC) devised by MAFF (now DEFRA). The system, which was most recently revised in 1988, divides land into grades according to the extent to which its physical or chemical characteristics impose long term limitations on land-use. Grade 1 is the most productive land, described as “excellent quality”, and Grade 5, the poorest “very poor quality”. Grade 3 is sub-divided into Subgrades 3a and 3b, land in 3a or better being classed as “best and most versatile.” DEFRA guidelines state that, where possible, land in Grades 1 to 3a should not be developed for non-agricultural purposes unless a special case can be made, such as the lack of availability of alternative land of poorer quality.
- 8.17 The published MAFF 1:250,000 Agricultural Land Classification Map of the Midlands provides only a broad indication of land quality and should not be used definitively on specific sites smaller than 80 ha in size. Moreover, the published MAFF does not subdivide Grade 3 and so cannot be used definitively in areas which are marginal to best and most versatile.
- 8.18 The study area is shown by MAFF mainly as an area of Grade 2 (very good quality) land on the high ground and Grade 3 (moderate quality) elsewhere. There is no Grade 1 land in the vicinity.
- 8.19 DMRB guidelines (Volume 11, Part 6, Section 9.3) consider the loss of 20 ha of best and most versatile land to be the threshold at which the Rural Affairs Teams of the Regional Government Offices (who have taken over this role from MAFF and DEFRA) should be consulted. The Rural Affairs Team for the Government Office for the East of England will be consulted as part of this public consultation exercise.
- 8.20 According to the MAFF 1988 guidelines, Banbury soils could be in either Grade 2 or Grade 3a, depending upon their depth and degree of stoniness. Morton soils are likely to vary between Grade 3a on the better drained loams and Grade 3b on the clays and shallow limestones. Denchworth soils, occupying the lowest ground, are in Grade 3b or 4 because of their heaviness.
- 8.21 The land of the study area is believed to be mainly in the best and most versatile categories of Grades 2 and 3a, passing to poorer Grade 3b and 4 land on the lower valley sides and floors. The approximate extent of these grades is shown in Figure 7.

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### Agricultural Units Affected

- 8.22 There are eight farm enterprises directly affected by the proposed bypass. Information has been gathered for these units by interviewing the farmers/owners or their agents. Every field has been viewed to verify the information provided.
- 8.23 The boundaries of the units are shown in Figure 6. Table 8.4 summarises the farming system of each, including size, tenure and land use.
- 8.24 The great majority of the study area is under winter wheat, oil seed rape and winter beans, produced in very large fields. There is a little grass in valley bottoms and in one field on Holding B.
- 8.25 Holding D supplements its farming income with a livery enterprise. The field bisected by the route-line includes a gallop and exercise area, located around the field perimeter.
- 8.26 Units I and J are rented. These individual fields could not be viable as stand-alone enterprises and their farming future will always form part of a larger unit. The impact of the bypass is assessed in relation to the enterprises that currently manage them.
- 8.27 Unit F belongs to Isham Church and its income is for charitable purposes. It is currently farmed on behalf of the church by a neighbouring farmer.

### OTHER LAND USES

#### Outstanding Planning Permissions

- 8.28 The Scheme does not impact any current planning applications. The most recent planning applications and consents are as follows:
- ◆ Planning Permission Ref No: 04/331. Demolition of a single storey structure and construction of part single storey/part two-storey extension to side and rear at No. 7 Hill Top Road, Little Harrowden. The Scheme runs to the east of this site. It was approved on 15<sup>th</sup> June 2004.
  - ◆ Planning Application Ref No: 04/497 for construction of a farm dwelling at Northfield Lodge, Orlingbury Road, Isham. The Scheme runs to the east of this site. It was approved on 13<sup>th</sup> October 2004.
  - ◆ Planning Application Ref No 04/498 for construction of 6 Poultry Houses with staff quarters and extension to access road at Northfield Lodge, Orlingbury Road, Isham. The Scheme runs to the east of this site. A decision had not been made on applications 04/497 and 04/498 at the time of writing. It was approved on 13<sup>th</sup> October 2004.
  - ◆ Sanders Barn is located to the west of the A509 at Hill Top. Planning permission was granted in June 2001 (Ref WP20010239F) for conversion of the derelict building to office use. This, to date has not been implemented but the site will be considered for TAG assessment should it be converted to residential use in the future.
  - ◆ The caretakers flat that is proposed as part of the redevelopment of Frisby Lodge (Ref #02/401, October 2002) may suffer from an adverse impact from the road, which would be approximately 125m away.

**Existing Development**

- 8.29 The Scheme runs between the village settlements of Pytchley and Isham, both of which provide limited local services for the surrounding population.. The Scheme does not impact any allocated development land or necessitate the demolition of any existing residential or agricultural units. It does traverse four public footpaths and one bridleway which are referred to in more detail in Chapter 15.

**Minerals and Waste**

- 8.30 There are no records of mineral extraction activity within the vicinity of the scheme. There are sand and gravel deposits in the Ise Valley which could be available for future extraction. The majority of ironstone activity has been located to the east of the Midlands Mainline Railway and north/east of Finedon.

**Table 8.4: Summary of Affected Agricultural Units**

Ref	Occupier	Landlord/Owner	Farm Characteristics
A	Mr J Hilsdon, Harrowden Farms Ltd, Wentworth farm, Gt Harrowden, W'boro. NN9 5AD	Northants LLP	920 ha arable enterprise.
B	Mr E A Shawley & Son, Langton Farm, Isham.	Occupier	30 ha mixed arable and beef enterprise. Affected land is used for arable and hay production.
C	Mr Duncan Bennie, J Bennie and Son, Home Farm, Burton Latimer, NN15 5LW.	Occupier.	Farmed as part of 486 ha arable enterprise.
D	Mr Brown, Manor House Farm, Isham, NN14 1HP.	Burton Latimer Estates owns all the affected land	49 ha mainly arable enterprise growing thatching straw. Also a livery business. Affected field is arable, but with an area of grassed permanent set-aside in valley floor and field perimeter, used for exercising horses.
E	Mr Middleton, Coppice Moor Farm, Pytchley.	Isham Church	Approx 10 ha under grass and arable. Managed by Mr Middleton, on behalf of the church, as part of his 600 ha arable enterprise.
F	D&A Reynolds, The Elms, Pytchley.	Occupier	139 ha arable and livestock enterprise. Affected land all arable. Pheasant shoot affected.
G	Reynolds Farms Ltd, Manor Farm, Little Harrowden or Old Rectory Hardwick.	Occupier	162 ha mainly arable enterprise with a little grass for sheep. Pheasant shoot affected.
H	Mr W Tarry, Pytchley Farms Ltd, Pytchley Lodge, Pytchley.	Jointly farmed with P Grange.	1000 ha arable enterprise.
I	Mr Duncan Bennie, J Bennie and Son, Home Farm, Burton Latimer, NN15 5LW.	Northants County Council	Farmed as part of 486 ha arable enterprise.
J	Mr Duncan Bennie, J Bennie and Son, Home Farm, Burton Latimer, NN15 5LW.	Northants County Council	31 ha field farmed as part of 486 ha arable enterprise.

## IMPACTS DURING CONSTRUCTION

- 8.31 This section describes the potential impacts during the construction phase. It covers all impacts likely to occur from the period of the initial erection of fencing and definition of the way-leave area, through to completion of all post-construction boundary repairs, replanting and landscaping works.

### Disturbance of Soils and Land Reinstatement

- 8.32 This section addresses the problem of landwork in an area of variable soil conditions. It highlights some of the areas where landwork difficulties may be encountered and also suggests the periods of an average year, during which it would be inadvisable for landwork to take place.
- 8.33 The proposed route necessitates the provision of cuttings and embankments and the creation of three balancing ponds. The majority of the areas required for the new road will remain within the permanent highway boundary. Additional areas will be required for landscaping purposes. Cuttings and embankments will remain within the highway boundary fence and there are no plans to regrade and return any of this land to agriculture. A number of small areas outside the highway boundary will be subject to disturbance caused by accommodation works and drainage measures.
- 8.34 Figure 9 shows the distribution of broadly different soil types classified by their working characteristics. The ability of soil to be worked or moved with a low degree of damage is dependent on its wetness regime, texture and field capacity period. There are two soil types within the study area as follows:
- ◆ Type 1: These areas are mainly deep, permeable loams that can be safely worked from late March to early December in an average year, but only from mid April to mid November in a wetter than average year. In a drier than average winter, it should be possible to work these soils for longer.
  - ◆ Type 2: These are areas of wetter, heavier soils that can be safely worked only from mid April to mid November in an average year. In a wetter than average year these soils may be workable only from early May to mid October.
- 8.35 Type 1 soils cover large areas of the route corridor and have the potential to be worked with limited risk of damage for most of the year. Without careful handling and restorative actions, Type 2 soils could take five to ten years to recover from compaction.
- 8.36 If mitigation measures are followed, it should be possible for soils to be replaced and restored to acceptable agricultural or landscaping quality. There should be no significant long term impact on soil structure, agricultural or landscape use.
- 8.37 As shown in Figure 7, the land of the route corridor is mainly Grades 2 and 3a with some Grades 3b and 4. Table 8.5 shows the total landtake (engineering and mitigation) in each ALC grade.

**Table 8.5: Loss of Agricultural Land by ALC Grade**

ALC Grade	Approx Landtake (ha)	% of Total Landtake
Grade 3b and 4	7.6	20
Grades 2 and 3a	30.83	80
Total	38.43	100

8.38 This shows that the greater part of the agricultural land lost to the road falls within the best and most versatile category.

#### **Severance during Construction**

8.39 There will be long-term impacts for units affected by severance which will commence during the construction phase. These are shown in Table 8.6. Severance may include closure of tracks and gateways or loss of access between the affected land and other areas farmed. The scale of impact used in this assessment is shown in Table 8.2.

**Table 8.6: Severance Impact during Construction**

Ref	Nature of severance	Impact without mitigation	Proposed mitigation	Impact with mitigation
A: Mr J Hilsdon,	None. Access will continue to be available from from B574	None	n/a	n/a
B: Mr Blaxley	Land to west of new road will be severed (currently accessed by track north of Fairfield Road	Major localised	Provision of temporary access until permanent access is created	Minor
C: MR D Bennie	Loss of access from Orlingbury Road	Major localised	Provision of alternative access to east of new road	Insignificant
D: Mr Brown	Land to west of new road will be severed	Major localised	Provision of temporary access until permanent access is created	Minor
E: Mr Middleton	Loss of access from A505	Major localised	No permanent vehicular access proposed	Minor
F: D&A Reynolds	None. Field accesses off Orlingbury Road, on either side of new road are unaffected	None	n/a	n/a
G: Reynolds Farms Ltd	Severance of land east of new road (currently accessed from Frisby Lodge track	Major farm wide	Provision of alternative access to east of new road from B574	Moderate farm wide
H: Mr Tarry	Loss of use of bridleway/farm track from A505 that serves south east part of farm.	Minor localised	No temporary access proposed continue to use existing at north end of land holding	Insignificant
I: Mr D Bennie	Loss of access from A505. However the main field access from near Spinney Hill is unaffected	Low	Provision of temporary access if required by farmer	Insignificant
J Mr D Bennie	None. Access from A505 unaffected	None	n/a	n/a

## Farm Buildings

8.40 No farm buildings will be demolished during the construction phase.

## Crop Losses and Timing

8.41 The physical land take will involve loss of arable crops on all the affected holdings. The timing of harvest is summarised in Table 8.7.

**Table 8.7: Timing of Harvest**

Crop	Harvest
Winter wheat (inc. thatching straw)	August and September
Oil seed rape	July and August
Winter beans	September and October
Spring barley	July

8.42 If no attempt is made to prevent crop losses there will be resultant loss of income from unharvested crops.

8.43 With forewarning the most significant construction impacts can be reduced or avoided.

## Disease Transmission

8.44 There were no current outbreaks of transmittable disease (e.g. Anthrax, Foot and Mouth) at the time of the assessment. In the event of a transmittable disease being present during construction the impact could be moderate adverse to severe adverse, depending on the disease.

8.45 Provided that the contract requirements are followed, there should be no heightened disease risk.

## Field Drainage

8.46 Interviews with farmers have established that every field along the line of the route has been underdrained, either in pre-war or even Victorian times using clay pipes or stone slabs. Some modern schemes with plastic pipes and gravel backfill also exist and the farmers will be able to provide plans on request.

8.47 Severance of field drainage pipes can result in the backing up of water upslope, with the result that wide areas become waterlogged. This will impede soil handling during construction as well as agricultural operations.

8.48 With mitigation in place, wetness caused by broken drains will be minimised. However, given the age of many of the drains, it is likely that the Contractor will inadvertently break drains whose position had not been predicted. Accordingly, attention must be given to monitoring wetness outside the new highway boundary and to reacting from complaints from farmers.

## Water Provision

8.49 There are no fields which support grazing livestock impacted by the bypass. There is no requirement to provide alternative water sources.

### Recreational Interests

- 8.50 Holdings F (D&A Reynolds) and G (Reynolds Farms Ltd) have pheasant shoots that will be affected by road construction. Impacts include disturbance to birds and the need for the guns to be kept away from the construction site.
- 8.51 Holding D supplements its farming income with a livery enterprise. The field bisected by the route-line includes a gallop and exercise area, located around the field perimeter. No mitigation is possible other than by compensation for holdings D, F, and G.

### Construction Facilities

- 8.52 There will be a need for working camps, soil and pipe stores, access tracks and parking areas. The locations of these have not been identified at this stage, as they will be left to the Contractors' own arrangements.
- 8.53 The main impacts are the potential for soil compaction by vehicles and pollution by fuel spillages etc. With mitigation measures in place these impacts are not expected to be significant.

### MITIGATION MEASURES DURING CONSTRUCTION

- 8.54 Care when handling soils will increase the speed of reinstatement. In line with the Manual of Contract Documents for Highway Works (Volume 1, Specification for Highway Works, Series 600 Earthworks) topsoil should not be stored in stockpiles of heights exceeding 2 m. Topsoil shall not be unnecessarily trafficked either before stripping or when in a stockpile. Stockpiles shall not be surcharged or otherwise loaded and multiple handling shall be kept to a minimum. If some of the soil parent material is stony, destoning of the topsoil may be necessary.
- ◆ Type 1 soils can be worked with little risk for the majority of the year, but landwork should be avoided when the soils are at field capacity. This should ensure that most soils to be stripped will be in a friable condition and capable of being stored without anaerobic conditions developing.
  - ◆ Type 2 soils should be worked only in the summer months, if possible
- 8.55 Where compaction does occur, permeability may be restored by subsoiling with standard agricultural equipment when the land is dry.
- 8.56 The effects of severance during construction can be mitigated by:
- ◆ providing new access prior to severance of the existing access, or;
  - ◆ maintaining access across the working width during the construction phase for livestock or machinery until such time that new access can be provided.
- 8.57 The relative impact of severance for each farming unit during the construction phase is assessed in Table 8.5. Long term provision of access will be necessary for these severed areas after the construction phase.
- 8.58 Farmers with arable crops will need up to twelve months notice if they are to avoid planting a crop that may not be harvested.

- 8.59 Conditions included as standard in County Council contracts request that the Contractor verify with DEFRA immediately prior to entry, the position regarding restrictions in force relating to the spread of animal, plant and poultry diseases. The proposed route will be fenced during the construction period, which will assist in preventing the transmission of diseases from farm to farm through contact with animals. Diseased animals should be kept away from the wayleave and, where possible, soil should not be moved from one farm to another.
- 8.60 Prior to entry, all farmers will be consulted to discuss in detail where drains and outfalls are known to exist. In the wettest areas, pre-construction drainage will be carried out to alleviate effects of drain cutting. During construction any drain severed will be connected to an alternative pipe to ensure continued flow.
- 8.61 Within the contract boundary, where areas are to be restored for agricultural or landscape purposes, soil handling and trafficking will be carried out as detailed in the section on Soils and Land Reinstatement. Any pollution will be rectified. Works outside the boundary will be subject to normal planning procedures and under the control of the Planning Authority.

#### IMPACTS WHEN OPERATIONAL

- 8.62 This section describes the permanent and long term impacts of the road scheme, i.e. those impacts that are irreversible or lasting for many years beyond the end of the construction period. Impacts that are long term may, in time, become less significant as patterns of farm ownership and management change. These include:
- ◆ Loss of agricultural land to road construction and associated works;
  - ◆ Severance and loss of access;
  - ◆ Disruption to drainage;
  - ◆ Cumulative impacts resulting from reductions in farm size, manageability, income as a result of land take, severance or loss of buildings.

#### Loss of Agricultural Land

- 8.63 When assessing land lost to farming a distinction is made between landtake by construction and mitigation works and land rendered unfarmable through permanent severance or the creation narrow strips. In the case of the latter, a strip of 50m is the narrowest that can be farmed within the prevailing arable system in the East Midlands which commonly employs sprayers with a boom width of 24m. Two sprayer boom widths, can be taken as the minimum farmable field width for cereal based rotations.

#### Severance and Loss of Access

- 8.64 The section on construction impacts (Table 8.6 and Figure 8) identifies land to which alternative accesses will have to be provided while road building and mitigation works are in progress. These temporary access measures will all have to be replaced by permanent arrangements at the end of the construction phase. These are categorised in Table 8.8.

### Drainage

- 8.65 It can be assumed that all the affected fields contain old field drains. These will be located and either repaired or diverted during the construction phase. It is possible that some drain damage will become evident only after the end of construction and so there will be a requirement to provide repairs and maintenance for a period of years.

### Recreational Interests

- 8.66 Holdings F (D&A Reynolds) and G (Reynolds Farms Ltd) have pheasant shoots that will be affected by the presence of a new road. Mitigation will not be possible other than by compensation.
- 8.67 Holding D supplements its farming income with a livery enterprise. The field bisected by the route-line includes a gallop and exercise area, located around the field perimeter. Mitigation will not be possible other than by compensation.

### Cumulative Impacts on Farm Viability

- 8.68 Each affected holding has been assessed to determine the cumulative effects of land loss, severance and disruption to management.
- 8.69 All impacts apart from landtake can be mitigated. Overall impacts on the agricultural enterprise are assessed both with and without the proposed mitigation. In most cases the main long term impact results from loss of land and disruption due to the division of the farm by the road.
- 8.70 The impact on most farm enterprises is insignificant or low and only Holding D (Mr Brown) will suffer a moderate impact.
- 8.71 Holding I is rented by Mr Bennie from Northamptonshire County Council and forms part of his 486 ha arable enterprise. The impact of the loss of this land from Mr Bennie's total enterprise is insignificant. It is most unlikely that this one field would ever be let as a single agricultural entity. If it were, the impact would be major. Therefore, two levels of impacts apply in this case.
- 8.72 Holding E, belongs to Isham Church, and is managed by Mr Middleton. It can realistically only be managed economically as part of a large enterprise. The impact of the loss of this land from Mr Middleton's total 600 ha enterprise is insignificant. Again, it is most unlikely that this one field would ever be let as a single agricultural entity, but if it were, the impact would be major. Therefore, two levels of impacts are applied here also.
- 8.73 The impacts on each holding, mitigation proposals and assessment of overall long term impacts after mitigation are summarised in Table 8.8.

### MITIGATION MEASURES WHEN OPERATIONAL

- 8.74 The soils of the route are representative of the district as a whole and so there is no opportunity to find an alternative route on poorer land.
- 8.75 Holding C would require the provision of a new gateway. On the other five holdings affected by severance there is a need for the provision of access tracks as well as new gateways.
- 8.76 Holding B (land belonging to Mr Blaxley) will lose its existing access to the fields west of the by-pass (currently accessed by track north of Fairfield Road). Following Rights of Way consultation mitigation measures of access will be via a new accommodation bridge.

- 8.77 Holding C (land belonging to Mr D Bennie) will require a new access from Orlingbury Road to replace the existing access which is located on the route line.
- 8.78 Holding D (land belonging to Burton Latimer Estates and farmed by Mr Brown) will lose its existing access to the fields west of the bypass (currently accessed from the A509, adjacent to the cemetery). Following Rights of Way consultation mitigation measures of access will be via a new accommodation bridge.
- 8.79 Holding E (land belonging to Isham Church) will lose its access from the A509. The only possible mitigation is the provision of access from the new roundabout, to be shared with Holding H.
- 8.80 Holding G (land belonging to Reynolds Farms Ltd) will suffer severance of land east of new road (currently accessed from the Frisby Lodge track). Following Rights of Way consultation the proposed mitigation is the provision of an accommodation bridge near Frisby Lodge with footpath use.
- 8.81 Holding H (land belonging to Mr Tarry of Pytchley Farms) will lose the use of the bridleway by which the south easterly fields are accessed from the A509. The obvious mitigation is the provision of a track to an access on the new roundabout, shared with Holding E.
- 8.82 Holding I (land belonging to Northamptonshire County Council and farmed by Mr D Bennie) will lose its existing access from the A509. However, there is an existing alternative access in close proximity to Spinney Hill and so it may not be necessary to replace the lost access. A triangle of land too narrow for arable use will be created in the southern end of the field
- 8.83 Holding J (land belonging to Northamptonshire County Council and farmed by Mr D Bennie) will maintain its existing access from the A509.

Table 8.8: Summary of Impacts on Agricultural Holdings

Holding	Type of occupancy	Size of farm (ha)	Landtake ha.	Impacts on access	Impacts on drainage	Sporting interests	Overall impact without mitigation	Overall impact after mitigation
A Farmed by Hr Hilsdon, Owned by Northants LLP	Farmer occupier	920	4.01	None	Field drains throughout	None in affected area	Insignificant	Insignificant
B Farmed by E A Shawley & Son	Farmer occupier	30	1.57	Land west of bypass will be severed. Private access track is one option shared with Holding D	Field drains throughout	None in affected area	Major	Minor
C Mr Bennie	Farmer occupier	486	3.10	Need to relocate field access from Oringbury Road	Field drains throughout	None in affected area	Insignificant	Insignificant.
D Mr Brown Manor House Farm	Tenant of Burton Latimer Estates	49	4.88	Land west of bypass will be severed. Private access track is one option shared with Holding B	Field drains throughout	Horse exercise area reduced	Major	Moderate
E Land owned by Isham Church	Managed by Mr Middleton, Coppice Moor Farm as part of his 600 arable enterprise	10	3.18	Access from A509 lost.	Field drains throughout	None in affected area	Major for this holding alone, but insignificant for Mr Middleton's enterprise	Major for this holding alone, but insignificant for Mr Middleton's enterprise

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F D&A Reynolds, Pytchley	Farmer occupier	139	5.2	None	Field drains throughout	Pheasant shoot affected	Minor	Minor
G Reynolds Farms Ltd	Farmer Occupier	162	12.80	Land east of bypass will be severed. Alternative access and track to be provided.	Field drains throughout	Pheasant shoot affected	Major	Moderate
H Mr Tarry, Pytchley Farms Ltd	Farmer occupier	1000	0.25	Access to southern fields via bridleway from A509 will be lost.	Field drains throughout	None in affected area	Minor	Insignificant
J Land owned by Northants County Council	Rented by Mr Bennie as part of 486 ha enterprise	31	3.44	None	Field drains throughout	None in affected area	Moderate for this holding alone, and insignificant for Mr Bennie's enterprise	Moderate for this holding alone, and insignificant for Mr Bennie's enterprise

## SUMMARY

- 8.84 This assessment has considered the impacts of the proposed Isham Bypass on landholdings during the construction and operational phases of the development. The assessment was carried out in accordance with DMRB, using evaluation criteria which allows a comparative analysis of impacts.
- 8.85 Impacts during the construction phase can be mitigated by:
- ◆ Observing guidelines for soil handling and storage;
  - ◆ Minimising effects of severance by maintaining or providing alternative accesses as specified;
  - ◆ Repairing or diverting field drains as necessary;
  - ◆ Providing adequate notification of intended entry date to lessen the likelihood of unexpected crop loss;
- 8.86 A number of impacts are long-term and can be mitigated by:
- ◆ Minimising the effects of severance by providing alternative accesses as specified, monitoring off-site field drainage and making good, as necessary;
  - ◆ Providing compensation for loss of sporting interests;
- 8.87 Assuming that the proposed mitigation measures are incorporated into the scheme, the long term impacts on agriculture can be summarised as follows:
- ◆ A total of 38.43 ha of agricultural land would be lost, of which 80% is estimated to be in the best and most versatile Grades 2 and 3a;
  - ◆ There should be no significant long-term soil damage;
  - ◆ There should be no long term impact on field drainage;
  - ◆ Of the eight affected farm enterprises, only two (Mr Brown, Manor House Farm and Reynolds Farms Ltd) will suffer a moderate adverse impact due to land loss and disruption. Impacts on the other enterprises will be minor or insignificant;
  - ◆ There are three small parcels of land (Holdings E, I and J) farmed by large neighbouring enterprises on which the overall impact of the land loss is insignificant. If they were managed as individual smallholdings the impact would be moderate or major, but this is not a likely scenario given the prevailing agricultural system of the region.
- 8.88 Overall, the impact of the Scheme on agricultural land use may be characterised as **slight adverse**.

## 9. LANDSCAPE AND TOWNSCAPE

### INTRODUCTION

9.1 This chapter assesses the effects of the Scheme on local landscape character and quality, outlines the landscape proposals and visual impact, and assesses the proposed lighting. This chapter also assesses the impact of the scheme on the townscape of Isham. The Scheme will bisect an area of arable farmland, and, although landscape proposals will reduce its visual impact by screening cars and roundabout lighting, they will also restrict views of the wider countryside so affecting the landscape character and quality. A further residual impact of the Scheme will result from night-time illumination of roundabouts especially during winter months.

### METHOD OF ASSESSMENT

- 9.2 The methodology for the assessment involved undertaking desk studies, collection of baseline data and site surveys on the context, character and quality of the study area; an evaluation of the townscape of Isham and an assessment of properties and local views potentially affected by the proposed bypass. The assessment has also involved the preparation of mitigation measures to reduce potential adverse effects.
- 9.3 The assessment of landscape character involved the analysis of landform, land cover and historical/cultural aspects to discern a pattern of similar landscape character across the study area. These are characterised by a broadly homogenous pattern of topography and drainage, vegetation cover, settlement, land-use and visual structure.
- 9.4 The assessment of landscape quality takes account of designations by local authorities, the historical and cultural associations of the area, and a visual appraisal undertaken by a Landscape Architect.
- 9.5 The visual impact assessment has been carried out in accordance with the following guidance:
- ◆ Guidelines for Landscape and Visual Impact Assessment by the Institute of Environmental Assessment and The Landscape Institute;
  - ◆ Volume 11 of the Design Manual for Roads and Bridges (DMRB) by the Highways Agency and associated organisations;
  - ◆ Transport Analysis Guidance (TAG)

### CRITERIA FOR MAGNITUDE AND SIGNIFICANCE OF IMPACTS

- 9.6 The guidance on visual impact recommends that the quality of a scene is considered without the scheme and compared with its quality if the scheme were built. Adverse or beneficial changes can be classified according to the following scale:
- ◆ Substantial – where there would be significant change
  - ◆ Moderate – where there would be noticeable change
  - ◆ Slight – where the change would be barely perceptible

- 9.7 The visual impact assessment consists of an evaluation of the estimated visual impact of the scheme. Changes in visual impact would arise as a result of engineering associated with the bypass, the changes to vegetation cover that this would bring about, and the introduction of lighting.
- 9.8 The following assessments of visual impacts have been made.
- ◆ Year one winter - The visual impact on a day in winter in the year the scheme would be open to traffic;
  - ◆ Year fifteen summer - The visual impact in the summer of the fifteenth year after opening, taking account of all the agreed proposed planting; off site planting by agreement is not included in the assessment.
- 9.9 Details of visual impacts of all properties affected by the Scheme are contained in the Visual Impact Schedules in Appendix E. Visual impacts for year one winter and year fifteen summer are illustrated in Figures 13 and 14 respectively.

## **BASELINE CONDITIONS**

### **Landscape Context**

- 9.10 Transport Analysis Guidance (TAG) sub-objectives have been used to quantify the impact on Landscape and Townscape.
- 9.11 The proposed Isham route is situated within the undulating landform of the Ise Valley which in this location is dominated by the towns of Wellingborough and Kettering. The local landforms consist of gently rolling clay, vales and ridges rising to over 100m (AOD) (see Figure 10, Volume 2).
- 9.12 The watercourses within the west to east running valleys, west of the Midland Main Line Railway, drain into the River Ise, east of the railway, which runs southwards towards the River Nene.
- 9.13 In addition to the areas in urban use, the warehouses and commercial buildings on the edges of Wellingborough, Kettering and Burton Latimer are a significant land use. However, most of the land is a mixture of arable and pasture use. Much of the high ground in the study area is grade 2 agricultural land. Woodlands are sparse and copses are the more common blocks of vegetation together with the numerous hedgerows, often containing trees. Waterside trees line the majority of the watercourses. Overhead electricity transmission lines skirt the area, running north to south, to the west of Orlingbury.
- 9.14 Figure 11 presents a series of photographs of the Isham study area and landscape.

### **Landscape Character**

- 9.15 The Countryside Character Initiative, overseen by the Countryside Agency, is concerned with the character of England's countryside at the end of the 20th Century and has mapped the country into 159 separate, distinctive character areas. These designations are intended to contribute towards guiding policy development and local planning, action and development

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- 9.16 The Schemes falls within the “Northamptonshire Vales” character area, lying alongside the “Rockingham Forest” character area which is to the north of the A14.
- 9.17 Some of the key characteristics of the “Northamptonshire Vales” character area are listed below:
- ◆ Gentle clay ridges and valleys with little woodland and strong patterns of enclosure, often with low well maintained hedges;
  - ◆ Distinctive river valleys of Soar, Welland and Nene with flat floodplains and gravel terraces;
  - ◆ The Ise Valley is in part dominated by the settlements of Wellingborough and Kettering;
  - ◆ Large towns of Leicester and Northampton dominate much of the landscape;
  - ◆ Frequent small towns and large villages, often characterised by red brick buildings;
  - ◆ Prominent parks and country houses;
  - ◆ Attractive stone buildings in older village centres and eastern towns and villages;
  - ◆ Frequent imposing, spired churches.
- 9.18 Northamptonshire County Council characterise the area as ‘The Upper Valleys’ in their publication *Landscape Strategy for Northamptonshire*, Countryside Services Branch August 1997. Its strongest distinguishing features are its ridges and vales, creating sense of enclosure. Its woodland and parkland are also prominent.
- 9.19 The *Landscape Guidelines Handbook* prepared by Northamptonshire County Council, Planning and Transportation, Countryside Services Branch January 1997, also describes the area as ‘The Upper Valleys’. This landscape is described as having:
- ◆ A rolling landform with a distinctive ridge and vale topography.
  - ◆ Impressive views from ridge tops over valleys.
  - ◆ There are many water features in the character area.
  - ◆ Part of this area has distinctive small fields with strong hedgerow patterns, field and hedgerow trees.
- 9.20 The latest characterisation assessment is called the Northamptonshire Landscape Characterisation Project and has been running for approximately two years. This has involved many partner organisations, consultants and individuals working towards a holistic Landscape Character Assessment with the landscape consultants ‘Landscape Design Associates’.
- 9.21 The Current Landscape Character Assessment Final Draft, May 2004, illustrates that the context of the scheme is located within the ‘Kettering and Wellingborough Slopes’ which is a sub-section of the ‘Rolling Ironstone Valley Slopes’ and ‘Sywell Plateau’, which is a sub-section of the ‘Clay Plateau’. The characteristics of the two character areas are set out below:

### 9.22 Kettering and Wellingborough Slopes

- ◆ The character area comprises a gently rolling landscape of ridges and valleys orientated in a north-east to south-west direction. The area is bordered by the River Ise to the east.
- ◆ The landscape is relatively well settled and urban influences from Wellingborough, Kettering, Rothwell and Desborough are significant in the character area.
- ◆ Land cover typically comprises large to medium scale arable fields interspersed with semi improved pasture, often smaller in scale and largely grazed by sheep. Small and medium scale fields also frequently occur in the north-western section of the area.
- ◆ Woodland cover is typical of the landscape type, including small to moderately sized broadleaved woodlands largely associated with parkland landscapes. A well-wooded character north of Kettering is created by combination of deciduous woodland, areas of new woodland planting, coniferous strips and limited felled and mixed woodlands.

### 9.23 Sywell Plateau

- ◆ The area is characterised by a dominance of large to medium to large scale arable fields generally regular or sub regular in shape, although their size decreases to the western side of the A43(T) from Walgrave to the southern boundary, where fields of improved grassland become more frequent. Improved pastures are also evident surrounding village settlements and on steeper landform adjacent to streams.
- ◆ Tree covered stream sides and occasional mature and semi-mature oak and ash in hedgerows also contribute to the overall woodland cover.
- ◆ Many of the village settlements display a compact, linear form and this comprises the principal settlement pattern. Church spires are also prominent within the landscape.

### ***Landscape Guidelines Handbook – Landscape Features***

- 9.24 *Landscape Guidelines Handbook* published by Northamptonshire County Council, Countryside Services Branch January 1997 sets out the Council's vision for a landscape which retains a rural character, building on the strong historical associations found in villages and open countryside. It states that new features should take advantage of undulating landform creating visual improvements within degraded areas.

Landscape guidelines include:

- ◆ Conserve and enhance small scale field patterns with their distinct tree and hedge boundaries.
- ◆ Conserve and strengthen 'Green Wedges': where land in the upper valleys act as a buffer between built-up areas, eg. Wellingborough and Irchester/Rushden.
- ◆ Where possible sympathetic hedgerow management should encourage gapping up and the tagging or planting of young trees.

- ◆ New woodland should complement the small scale, infilling shapes similar in scale to field sizes, where possible using hedges and trees to link the new woodland.
- ◆ Replanting gaps with new saplings and allowing some stretches to grow on will improve wildlife habitat and views.
- ◆ New woodland should extend down ridges creating a 'branching' effect linking to hedges. Focus on existing features; extending and consolidating.

### Landscape Quality

9.25 Landscape Quality is a term used to indicate value based on character, condition and aesthetic appeal. Assessment is based upon a five point scale (i.e. highest quality, very attractive, good landscape, ordinary landscape, and poor landscape). Four levels of landscape quality were recognised during the landscape quality assessment at Isham:

#### *Very Attractive Landscape Quality*

9.26 This includes the designated Conservation Areas of Isham, Pytchley and Burton Latimer; the Conservation Area of Finedon and Finedon Hall and grounds; Orlingbury Hall and grounds and Great Harrowden Hall and grounds (listed in the Historic Parks and Gardens Register).

#### *Good Landscape*

9.27 Most of the study area is an undulating landscape with distinctive river valleys and villages and is considered to be of Good Quality.

#### *Ordinary Landscape*

9.28 Landscape adjacent to the settlement of Burton Latimer and the northern outskirts of Wellingborough is considered to be of Ordinary Quality, as it is dominated by the urban fringe of the settlements.

#### *Poor Landscape Quality*

9.29 The industrial areas north and south of Burton Latimer and on the northern outskirts of Wellingborough are considered to be of Poor Quality, as the buildings are out of scale with the surrounding landscape, and visually dominate the area.

### Townscape Assessment

9.30 The townscape context within the study area falls broadly into three categories; the towns of Kettering and Wellingborough; the smaller town of Burton Latimer and large village of Finedon; and historic villages which include Isham, Pytchley, Orlingbury, Little Harrowden and Great Harrowden.

9.31 A large proportion of the housing in Kettering is brick built and was constructed in the 19th and early 20th Century. The settlement also contains modern industrial buildings and out-of-town shopping developments particularly around the A14 Pytchley junction.

- 9.32 Wellingborough is a market town of Anglo-Saxon origin with many notable listed buildings. Historically trades have included spinning and shoe-making. However, since the Second World War there has been dramatic increase in the size of the population with an influx of people from London and other cities resulting in greater urbanisation. This has resulted in extensive peripheral housing developments.
- 9.33 Burton Latimer is adjacent to Isham to the east of the Midland Main Line Railway. The majority of the older part of the settlement lies to the east of the former A6 in Church Street. This has a linear form with some fine historic buildings and is designated a Conservation Area. To the west of the former A6 is found the expanded settlement of the early and mid twentieth century, the main shopping facilities and schools.
- 9.34 Burton Latimer has historical associations with the Northamptonshire boot and shoe industry and during the twentieth century became the home of Weetabix and Alumasc. These firms now dominate the economic base of the town and there is a net inflow of workers to the Burton Latimer area. New housing has been built on the south western edge of Burton Latimer.
- 9.35 Finedon has a substantial amount of municipal inter and post war housing, together with the more recent developments. The older part of the village is designated as a Conservation Area. The village has over 50 listed buildings, many of which are built of local ironstone.
- 9.36 Isham stands on undulating high ground, flanked to the east by the River Ise and railway. Views from the approach roads are dominated by the church. The narrow streets at the core of the village, centered in Church Street, Middle Street and South Street, contain many stone buildings and walls dating largely from the 17th to 19th centuries, although the church is of earlier origin. Within this area, which forms the centre of the Conservation Area, there are many listed buildings. There is some modern infill development within the Conservation Area. Housing estate developments have been built on the northern side of the village, centred in Fairfield Road.
- 9.37 Pytchley is of a similar size to Isham and contains many notable historic buildings and a Conservation Area.
- 9.38 Orlingbury is a nucleated settlement centred around an attractive green which is dominated by the Church of St Mary's and Orlingbury Hall, the grounds of which penetrate into the heart of the village. More recent housing developments have largely been established on the periphery.
- 9.39 Little Harrowden essentially developed in a linear pattern along a ridge between streams. The older part of the village is centred on Main Street. This area contains a number of listed buildings and redevelopment sites.
- 9.40 Great Harrowden lies immediately to the north of the built up area of Wellingborough and is bisected by the A509 road to Kettering. Its historic form is closely connected to Great Harrowden Hall and its extensive grounds. The majority of the residential properties lie on the west side of the main road, forming a short ribbon of development fronting Orlingbury Road. The early 18th century hall's impressive history and architectural quality are reflected in its Grade 1 listing. The associated formal gardens and park are listed Grade II\* in the County Register of Gardens.

## IMPACTS DURING CONSTRUCTION

### Landscape

9.41 During the construction phase there would be various changes to the landscape and landform as the ground is re-profiled to accommodate the road. There may be large mounds produced to store topsoil that is stripped prior to the construction of the road, which will then be redistributed across the site once construction work is complete, prior to the landscape scheme implementation.

### Visual Impact on Properties

9.42 The construction of the bypass would be likely to have a significant adverse impact on the views from properties close to the route, particularly where existing vegetation is to be removed and for those near to the contractor's compound.

9.43 Site vehicles would be evident as they move along the route, and there would be an adverse impact at the entrance and exit points. The landscape offers little opportunity to screen construction activities through local landform or existing vegetation.

### Townscape

9.44 Routes to the construction site would be discussed and agreed with the Highways Agency and the local highway authority, but there is a possibility that construction traffic may need to pass through Isham or surrounding settlements, which would have a significant adverse impact on the townscape of these villages for the duration of the works. There may also be the need to use temporary traffic management systems, such as traffic lights, which could cause queuing traffic within the built up areas.

## MITIGATION MEASURES DURING CONSTRUCTION

9.45 No landscape mitigation measures are currently proposed during construction.

## IMPACT WHEN OPERATIONAL

### Visual Impact on Properties – Year One Winter

#### *Substantial Impact*

9.46 Seven properties in Fairfield Road and Winston Drive would suffer a substantial adverse visual impact from the scheme. These are the properties on the western edge of Isham, which are closest to the new road. The rear of the properties faces directly over the road which would be in cutting.

9.47 Three properties in Ormond Place, on the southern edge of Isham, would experience substantial visual impact as they currently look down into the Hardwick Brook valley, a view which would be significantly altered by the road crossing the brook on a 7.5m embankment.

9.48 The caretakers flat that is proposed as part of the redevelopment of Frisby Lodge (planning permission #02/401 granted 9 Oct 2002) may suffer from a substantial adverse impact from the road, which would be approximately 125m away, and on embankment.

- 9.49 Five properties in Furnace Lane would encounter substantial adverse visual impact as a result of their proximity to a new roundabout which would be lit at night. Whilst the road would be in cutting at this point, the lighting, particularly in winter, would have an adverse impact upon the properties.
- 9.50 Six properties at 'Hillside' (just off A509 Kettering Road) would suffer a substantial adverse visual impact as from the front of these properties there would be oblique views of both the new lit roundabout, and also the 10m embankment as the road crosses the brook close to Great Harrowden Golf Course.
- 9.51 The four most easterly properties on B574 Hill Top Road would suffer a substantial adverse visual impact from oblique views to the new lit roundabout and their proximity to the noise barrier along this stretch of the route. However, they would benefit slightly from the road being slightly further away than existing.

#### *Moderate Impact*

- 9.52 Two properties at Sunny Hill would encounter moderate adverse visual impact due to their proximity to the proposed road and earth mounding (7m embankment) as it joins the existing A509 Kettering Road, close to A14 Pytchley Roundabout. It would also suffer some impact from the new lit roundabout where the proposed road joins the existing A509 Kettering Road.
- 9.53 Thirteen properties on Fairfield Road would have rear views of the proposed road on embankment, the new lit roundabout and the proposed balancing pond. However, they are some distance away from these features. Therefore, they would experience moderate adverse visual impact.
- 9.54 Six properties on Fairfield Road would have rear, and in some cases, side views of the proposed road and earth mounding, along with part of the noise barrier that is proposed along the stretch of road as it passes to the west of Isham. They would experience moderate adverse visual impact.
- 9.55 Three further properties in Fairfield Road would experience moderate adverse visual impact as they have oblique views to the road as it is on embankment, and to the new noise barrier.
- 9.56 Six properties on Winston Drive would have similar oblique views of the new road from the rear and side, therefore they would suffer from a moderate adverse visual impact.
- 9.57 Three properties at Pioneer House would suffer a moderate adverse visual impact from the proposed road, as their views across the Hardwick Brook and valley would be affected by the road crossing on embankment.
- 9.58 One property at Springfield (off Orlingbury Road) and one property at Dunbelly Barn (also off Orlingbury Road) would be close to the new road, and would have views through the existing hedgerows, particularly from upstairs windows; they would therefore experience moderate adverse visual impact.
- 9.59 A total of eighteen properties on Hill Top Road would experience moderate adverse visual impact as they are close to both a new lit roundabout and also a noise barrier.

### *Slight Impact*

- 9.60 A total of eight properties on Fairfield Road would experience slight adverse visual impact as they would have oblique views of the new road from the rear of the properties.

### **Visual Impact on Properties – Year Fifteen Summer**

#### *Substantial Impact*

- 9.61 Seven properties in Fairfield Road and Winston Drive would still experience substantial adverse visual impact as a result of the close proximity of the road (which would be in cutting) and the noise barrier, despite benefiting from landscape improvements.
- 9.62 Four properties on Hill Top Road would also still experience substantial adverse visual impact due to their proximity to the new lit roundabout, despite some improvements from the removal of the existing road immediately in front of the premises, and new planting.

#### *Moderate Impact*

- 9.63 Three properties on Ormond Place, and the development at Frisby Lodge would experience a moderate adverse visual impact in year fifteen summer, as they are close to the new road, and whilst the vegetation would have grown, there would still be a significant change to the landscape in their vicinity.
- 9.64 Five properties on Furnace Lane would still experience a moderate adverse visual impact due to their proximity to the lit roundabout at the Southern end of the road.
- 9.65 Six properties at 'Hillside' (off A509 Kettering Road) would continue to summer a moderate adverse visual impact from the road development due to their proximity to the road, and also the impact of the earth mounding on their views across the valley.
- 9.66 Ten of the properties on Hill Top Road would experience a moderate adverse visual impact in year 15 summer as they would continue to have oblique views of the lit roundabout, although maturing vegetation would mean an improved situation from year 1 winter.

#### *Slight Impact*

- 9.67 A further fifty-one properties would experience slight adverse visual impact in year fifteen summer. All but eight of these properties would have experienced moderate adverse visual impact in year one winter and the remainder would continue to experience slight adverse visual impact in year fifteen summer.

### **LIGHTING ASSESSMENT**

- 9.68 This section will consider the existing situation, proposed lighting scheme, potential visual effects of the proposed lighting scheme, mitigation of any effects, and an outline of the areas that would be affected by lighting proposals.

### Existing situation

- 9.69 The Institution of Lighting Engineers published its 'Guidance Notes for the Reduction of Light Pollution' in 2000 (Appendix R) which recommends that Local Planning Authorities specify in their Development Plans, environmental zones for exterior lighting control. Table 9.1 outlines the categories of the environmental zones classified by the Institute of Lighting Engineers.

**Table 9.1: Environmental Zones**

Category	Examples	
E1	Intrinsically dark areas	National Parks, Areas of Outstanding Natural Beauty etc.
E2	Low district brightness areas	Rural or small village locations
E3	Medium district brightness areas	Small town centres or urban locations
E4	High district brightness areas	Town/city centres with high levels of night-time activity

- 9.70 At present the land over which the scheme will travel is not lit and is considered to be a 'low district brightness area' (E2)

### Proposed lighting scheme

- 9.71 The two proposed roundabouts and approaches will be lit, these are located south of the A14 Pytchley roundabout and at the junction with the B574 at Hill Top Road. The proposed lighting scheme has been formulated based on the required level of safety and security for users and the need to minimise visual impact, both daytime and night-time.
- 9.72 The proposed lighting would consist of single arm columns 10m in height, the lanterns chosen would be a full cut-off flat glass type with a high pressure sodium (SON) light source, which produces a more natural rendition of colour.
- 9.73 This design has been chosen as it creates the least environmental impact. As it is difficult in the short term to form an effective screen, the key to minimising the impact of the lighting is the design of the lighting itself. The choice of full cut-off lanterns reduces the amount of light 'spillage' at the cost of closer column spacing than other lantern types.

### VISUAL EFFECTS OF THE PROPOSED LIGHTING SCHEME

- 9.74 Visual effects have been assessed for daytime impact as part of the visual impact analysis. Daytime impacts relate to the visual intrusion of the columns in the landscape.
- 9.75 Distance between properties and the lighting is an important element in assessing the intrusiveness of the scheme. Over a long distance, the lighting columns would become an insignificant feature in the landscape. At night, though cut-off lanterns restrict light spill to a limited area, the light source may be visible over a considerable distance.
- 9.76 The likely night-time impact of the proposed lighting is that the environmental zone category for this part of the scheme will increase to a 'medium district brightness area' (E3).

## MITIGATION

- 9.77 Screening of the lighting by structures or vegetation that exist or are placed between the lighting and the observer will help to reduce the overall visual impact. The effectiveness of vegetation will depend on its height and density, and also whether or not shrubs and trees are deciduous, which clearly would affect the intrusiveness on a seasonal basis. Additional planting is proposed in the vicinity of each roundabout, which may alleviate the visual impacts to some extent. The night-time impact of the lighting will be difficult to mitigate.

## MITIGATION MEASURES WHEN OPERATIONAL

### Landscape Proposals

- 9.78 The landscape proposals would aim to reflect and enhance the character of the area.
- 9.79 The principles and objectives are listed below:
- ◆ To integrate the scheme into the surrounding landscape;
  - ◆ To screen unattractive views from properties and footpaths;
  - ◆ To provide a pleasant environment for the road user, including retention of attractive views from the road where possible;
  - ◆ To retain existing roadside planting where possible, and assess and manage it as appropriate;
  - ◆ To retain the distinct tree and hedgerow boundaries of fields, through retention or replanting.
  - ◆ To create new copses to complement those existing and to link with existing vegetation.
  - ◆ To break out redundant roads, topsoil and plant or return to agriculture as appropriate;
  - ◆ To undertake all planting following good horticultural and ecological principles;
  - ◆ To design balancing ponds to have a value as ecological habitats.
- 9.80 For ease of description of the proposals the bypass has been divided into four sections; a northern section from the A14 Pytchley Roundabout to the new roundabout with the Kettering Road; a section from the new northern roundabout past the western edge of Isham to the Orlingbury Road Bridge, the section south of the new Orlingbury Road Bridge to the new southern roundabout at the junction with B574 Hill Top Road; and finally the section from the new southern roundabout to the tie-in with the existing A509 Wellingborough Road. The landscape proposals are illustrated in Figure 12.

*Landscape Proposals from A14 Pytchley roundabout to new northern roundabout*

- 9.81 The road will be screened by lengths of dense tree and shrub planting on both sides of the road, from the junction with the Pytchley Roundabout along to the new roundabout at the junction with the old A509 Kettering Road, except for the area behind the proposed lay-by, where a hedgerow with occasional trees will be used.
- 9.82 The realigned section of the old A509 Kettering road will be lined with hedgerows with occasional trees and shrub planting, tying into the existing planting, and then merging with the dense tree and shrub planting in the immediate surroundings of the new roundabout.
- 9.83 The area around the new balancing pond will be a mixture of wetland grasses, sedges and rushes. The area to the northwest of the pond will be planted with the wetland tree and shrub mix species. Access through the area will be maintained for the realigned public footpath.

*Landscape Proposals from new northern roundabout to Orlingbury Road Bridge.*

- 9.84 The new road will be densely planted with the tree and shrub planting mix along both sides. Areas of species rich grassland will be included on the lower parts of the cutting slopes, for ecological reasons and to provide visual interest for the motorist.

*Landscape proposals south of Orlingbury Road Bridge to new roundabout.*

- 9.85 South of Orlingbury Road dense tree and shrub planting is proposed until the scheme reaches the cutting west of Ashpole Plantation. The majority of the cutting will be sown with species rich grassland, the crests of the cutting being planted with tree lined hedgerows and trees and shrubs. Tree and shrub planting and species rich grassland continue to the southern roundabout. The balancing pond north of Hardwick Brook will be surrounded by wetland grasses with occasional wetland trees, and wetland trees and shrubs at its northern extent. Where the edge of the scheme interfaces with agricultural fields arable headland grasses are proposed for ecological reasons; this proposal occurs throughout the scheme.

*Landscape Proposals from the new southern roundabout to the existing A509*

- 9.86 Tree planting on the roundabout provides visual interest, and existing and proposed planting in the vicinity of this roundabout will help to screen the roundabout when it is lit at night. There will be dense tree and shrub planting in order to help screen the properties at Hill Top, Hill Side and along Hill Top Road.
- 9.87 The dense tree and shrub planting will continue along both sides of the proposed roads until it ties into the vegetation alongside the existing road, where the roads merge. The area around the new balancing pond would be planted with the wetland tree and shrub mix, alongside an area of wetland grasses, sedges and rushes.

## SUMMARY

9.88 Table 9.2 compares the visual impacts on properties in year one winter and the summer of year fifteen.

**Table 9.2: Visual Effect on Residential Properties**

Year 1 Winter	Visual Impact	Year 15 Summer
26	Substantial Adverse Impact	11
53	Moderate Adverse Impact	25
8	Slight Adverse Impact	51
87	Totals	87

- 9.89 The visual impact figures demonstrate that there would be a 58% reduction in the number of properties experiencing substantial adverse visual impact from year one winter to year fifteen summer. The reduction in the number of properties experiencing moderate adverse visual impact from year one winter to year fifteen summer would be 53%.
- 9.90 The bypass will have a **large adverse** impact (TAG Landscape Sub-objective) on the landscape as it crosses three valleys against the lie of the land, necessitating embankments of up to 10m in height and cuttings down to 9m in depth.
- 9.91 The steep embankment and cutting slopes would make the road more intrusive on the surrounding landscape. The two proposed lit roundabouts would have an adverse night time impact.
- 9.92 Landscape mitigation measures have been proposed to reduce the impact of the road proposals, and to link the proposals with the surrounding landscape. These take into account the potential for habitat creation, including wetland and grassland habitats to diversify the local environment.
- 9.93 The bypass will benefit the character of Isham village by remaining through traffic and result in a **moderate beneficial** impact (TAG Landscape Sub-objective) on townscape.

## 10. BIODIVERSITY

### INTRODUCTION

- 10.1 This chapter describes the existing ecological characteristics in the study area, identifies the ecological impacts of the proposed route and describes the requirement for mitigation measures that would be included within the design proposals. Mitigation is taken into account in the assessment of the overall (residual) impact.
- 10.2 The following sections provide:
- A description of the method of survey and assessment;
  - A description of the existing conditions;
  - An evaluation of the known ecological features within the study area in terms of their nature conservation value in the TAG worksheets;
  - An identification of key ecological issues;
  - An assessment of the predicted ecological impacts of the proposed route including habitat loss and fragmentation, disturbance and potential off-site impacts;
  - Proposed mitigation measures in respect of adverse impacts;
  - Identification of residual impacts taking account of proposed mitigation measures.

### METHOD OF ASSESSMENT

- 10.3 The assessment has been undertaken according to Stage 3 DMRB (Design Manual for Roads and Bridges), referring also to TAG methodology and terminology. TAG provides specific advice on evaluating features of nature conservation interest, assessing the magnitude and significance of impacts and assigning an overall impact assessment score.
- 10.4 Details of statutory and non-statutory designated sites for nature conservation and legally protected species occurring within 2km of the proposed route were gathered from English Nature (EN) and Northamptonshire Wildlife Trust (NWT). The UK Biodiversity Action Plan (BAP) and the Northamptonshire BAP were consulted in respect of locally notable species and habitats.
- 10.5 Walkover surveys of a 1km wide corridor of land centred on the proposed route were undertaken in February 2003. The results of these surveys were verified in October 2003, along with more detailed surveys for protected species as described below. This included sites of importance for nature conservation that may also be affected by the development.
- 10.6 The ecological surveys have not tried to produce a comprehensive list of plants and animals for the site, as any ecological survey will be limited by factors that affect the presence of plants and animals such as the time of year, migration patterns and behaviour. However, the results allow an appropriate level of assessment for Stage 3 DMRB, given the habitats and species present.

- 10.7 The surveys broadly followed the 'Extended Phase 1' methodology as set out in Guidelines for Baseline Ecological Assessment (Institute of Environmental Assessment 1995). The extended Phase 1 habitat survey provides information on the habitats in the survey area and assesses the potential for notable fauna to occur in or adjacent to the site. Plant names follow New Flora of the British Isles (2nd edition, Stace 1997). Figure 15 shows a colour-coded habitat map of the route corridor with numbered target note points and the corresponding notes are given in Appendix G.
- 10.8 With respect to legally protected species, the following characteristics were recorded:
- Signs of potential roosting sites for bats, particularly in mature trees;
  - Signs of badger activity including setts, tracks, snuffle holes and latrines;
  - Sightings of birds and habitat suitable for breeding birds;
  - Sightings of and evidence of habitat use by deer such as faeces, browsing marks on trees and wallows;
  - Potential habitat for great crested newts, such as suitable breeding ponds in association with appropriate terrestrial habitat;
- 10.9 Along watercourses, the following signs of protected species activity were recorded:
- Evidence of water vole activity such as the presence of burrows, feeding stations, faeces and latrines;
  - Signs of otter activity and features that may provide suitable resting places.

## CRITERIA FOR SIGNIFICANCE OF IMPACT

10.10 The following criteria were used in conjunction with the TAG guidance to assess the significance of adverse ecological impacts.

**Table 10.1 Significance of Impacts for Ecology**

Large adverse	<p>Loss of, permanent damage to or adverse impact on integrity of any part of a site of international or national importance;</p> <p>Loss of a substantial part or key feature of a site of county importance;</p> <p>Loss of favourable conservation status (FCS) of a legally protected species;</p> <p>Loss of or damage to a population of nationally rare or scarce species.</p>
Moderate adverse	<p>Temporary disturbance to a site of international or national importance, but no permanent damage;</p> <p>Loss of or permanent damage to any part of a site of county importance;</p> <p>Loss of a key feature of local importance;</p> <p>A substantial reduction in the numbers of legally protected species such that there is no loss of FCS but leaves the population significantly more vulnerable;</p> <p>Reduction in the amount of habitat available for a nationally rare or scarce species, or species that are notable at a regional or county level.</p>
Slight adverse	<p>Temporary disturbance to a site of county value, but no permanent damage;</p> <p>Loss of, or permanent damage to, a feature with some ecological value in a local context, but no designation;</p> <p>A minor impact on legally protected species but no significant habitat loss or reduction in FCS;</p> <p>A minor impact on populations of nationally rare or scarce species or species that are notable at a regional or county level</p>
Negligible	<p>No impacts on sites of international, national or county importance;</p> <p>Temporary disturbance or damage to a small part of a feature of local importance;</p> <p>Loss of or damage to land of negligible nature conservation value;</p> <p>No reduction in the population of legally protected, nationally rare, nationally scarce or notable (regional/county level) species on the site or its immediate vicinity.</p>

## BASELINE CONDITIONS

### Habitats

10.11 The locations and extent of both statutory and non-statutory sites of importance for nature conservation (designated sites) within 2 km of the proposed route and habitats recorded during walkover surveys are shown on Figure 15.

### *Designated Sites: Statutory sites – SSSIs*

- 10.12 There is one SSSI, South Field Farm Marsh SSSI, located within the study area. The site, which is also a NWT nature reserve, is notified because it is the largest known area of long established tall grass washland in Northamptonshire. This habitat is thought to be a characteristic (but now much reduced) vegetation type of alluvial soils occurring in river valleys subject to winter flooding. The site contains a base-rich and floristically diverse mire which overlies silty peat deposits watered by calcareous springs. Flora typical of this part of the site includes wild angelica, marsh thistle, water horsetail and greater birds-foot trefoil.
- 10.13 This rare local community supports a specialised and uncommon invertebrate fauna, in particular soldier flies, craneflies and hoverflies. There have been signs of otter (spraints and tracks) recorded at this site.
- 10.14 Other associated habitats on the site consist of wet meadows and marshes comprising tufted hair grass, reed canary grass, sedges, and floating sweet grass. However, this site has already been adversely affected and reduced in size by the construction of the A14. This site is of national importance for wildlife and is therefore classified as being of high biodiversity value according to TAG.

### *Designated Sites: - Non statutory sites*

- 10.15 There is one National Wildlife Trust prime site, which is also known as a County Wildlife Site (CWS). Big Covert CWS is located within 500m of the proposed route. This is an area of local conservation and biodiversity value, protected through the Northamptonshire Structure Plan.
- 10.16 It consists of mature woodland lying adjacent to a meandering tributary of the River Ise. Few details of the nature of this site are available due to access restrictions. However, the site is recorded as having bluebell, wood sorrel and buckler ferns within its ground flora assemblage and probably constitutes a good habitat for local wildlife. This site is of county importance for wildlife and therefore classified as being of medium biodiversity value according to TAG.

### *Other Habitats*

- 10.17 Habitats within the survey corridor can best be described as predominantly arable land with hedge field boundaries, blocks of plantation woodland and two watercourses that cross the proposed route. One watercourse is situated in the northern section of the route, the other is in the south. Both are tributaries of the River Ise which runs north to south some 1.5 km to the east of the proposed route. These habitats are described below.
- 10.18 Other important wildlife habitats associated with the River Ise corridor include areas of semi-improved and marshy grassland and swamp. The railway line that runs north to south, to the east of Isham village, is also an important local feature and is valuable as a wildlife corridor especially for birds and mammals. These areas are separated from the proposed route by Wellingborough Road and Isham village.

### *Arable land and agriculturally improved grassland*

- 10.19 Arable fields were the main habitat type recorded within the survey area and, at the time of survey, mainly consisted of bare ground with vegetation confined to field boundaries such as hedges and ditches dividing fields. These provide feeding habitat for a number of birds listed as being of conservation concern by the British Trust for Ornithology (BTO) including; skylark, lapwing, golden plover and field fare. Foraging routes of badger and a brown hare were also recorded in arable fields during surveys.
- 10.20 There were some small areas of improved grassland recorded near North Lodge and near the stream in the section of the route to the north of the cemetery (target note 3)
- 10.21 These habitats are generally considered to be of negligible biodiversity value according to TAG, unless particular areas support a frequent or significant population of a protected species such as badger, or birds of conservation concern such as skylark. It is therefore likely that, in this case, the arable fields will have a lower rather than negligible biodiversity value according to TAG.

### *Semi-improved grassland*

- 10.22 There was one area of less intensively managed grassland associated with the watercourse to the north of the cemetery (target note 2). Typical ground flora vegetation included cocksfoot, false oat grass, tufted hair grass, crested dog's-tail and black knapweed. Some trees had been planted recently, including Scot's pine, horse chestnut, white poplar and blackthorn.
- 10.23 This area provides an important section of riparian zone to the watercourse and provides habitat for bird species of conservation concern recorded in the vicinity such as bullfinch, skylark and raptors such as merlin and barn owl. This area can therefore be classified as being of medium biodiversity value according to TAG because it is a feature of high local importance for wildlife and provides habitat for endangered bird species.

### *Woodland and scrub*

- 10.24 Several broad-leaved copses were recorded throughout the survey corridor and were mainly used for pheasant rearing. Ashpole Plantation and Cock-o-Roost Spinney (target notes 5 and 7) supported oak ash woodland with a significant proportion of sycamore and crack willow also present in some stands. Ground flora was impoverished, consisting of bramble, snowberry, nettle, male fern and the moss *Eurynychium praelongum*. These areas of woodland are well interconnected by hedges.
- 10.25 Signs of badger activity were recorded in some woodland areas such as Cock-o-Roost Spinney and all the copses had the potential to support setts. They will also provide breeding habitat for common woodland birds and raptors such as sparrow hawk and tawny owl.
- 10.26 The woodland habitats within the survey area are likely to be of lower medium biodiversity value according to TAG because they provide habitats for badger and support bird species of high national concern such as bullfinch.

### *Hedgerows*

- 10.27 The hedges were generally species poor, comprising hawthorn, blackthorn and ash with occasional mature oak and ash, and with a poor structure due to regular flail cutting. Some contained mature trees with cavities that may provide suitable locations for bat roosts. The hedgerows provide an important network of foraging routes for badger as evidenced by the large number of paths and latrines recorded along hedges throughout the survey corridor.
- 10.28 They also provide habitats for over-wintering birds. Yellowhammer, bullfinch, fieldfare, siskin and merlin were recorded during walkover surveys undertaken in October 2003. They will also provide nesting sites for many species during the breeding season.
- 10.29 Generally the hedges in the study area are of local significance for wildlife. However, those that have a more mature structure and possess features such as mature trees may be of higher importance for nature conservation. As a network the hedges within the survey corridor function as important links to other more continuous woodland habitats. Overall hedges potentially affected by the proposed route are likely to be of lower biodiversity value according to TAG. However if certain sections contain an important feature such as a bat roost of high local importance then this would elevate the value of that section to medium value.

### *Watercourses*

- 10.30 Two tributaries of the River Ise would be crossed by the proposed route, located to the north and south of Isham. They include Pytchley Brook and Hardwick Brook. They are narrow, ranging from 1 -2m in width and meander though mainly arable fields. The water in these streams was clear with medium flows over a silt substrate. In-channel and marginal vegetation was present, and was dense in some sections, including fool's watercress, water forget-me-not, branched bur-reed, water figwort and meadowsweet. (Target Notes 2 and 4). Many sections were lined with mature trees such as crack willow and alder and these provide habitat for breeding and over-wintering birds.
- 10.31 Other important wildlife habitats associated with the River Ise corridor include areas of semi-improved and marshy grassland and swamp. The railway line that runs north to south, to the east of Isham village, is also an important local feature and is valuable as a wildlife corridor especially for birds and mammals. These areas are separated from the proposed route by Wellingborough Road and Isham village.
- 10.32 The stream corridors offer potential habitat for protected species such as kingfisher, feeding and roost habitat for bats and dispersal opportunities for other protected species such as otter and water vole, both of which have been recorded locally. The silty substrate of both streams is generally considered to be unsuitable for white-clawed crayfish. This is discussed further under the heading of 'protected species'.

- 10.33 The principal value of the watercourses and their associated riparian habitat is that they provide important cover and corridors for the movement of wildlife in what is otherwise unfavourable (ie intensively farmed) terrain. As such they are of high local significance for a range of wildlife and can be evaluated as being of medium biodiversity value according to TAG. They also provide habitat for bird species of national nature conservation concern and have the potential to support legally protected species.

#### *Buildings*

- 10.34 Derelict farm buildings such as Frisby Lodge (not accessible during walkover surveys) may contain bat roosts.

### **Protected Species**

- 10.35 Potential habitat for a number of legally protected species and evidence confirming the presence of some species was also found during some of the walkover surveys. The relevant articles of legislation are; the Wildlife and Countryside Act 1981(as amended) (WCA), the Conservation (Natural Habitats &c) Regulations 1994 and the Protection of Badgers Act 1992.

#### *Badger*

- 10.36 There was evidence of badger activity throughout the area surveyed. An active sett, and other signs of badger, including footprints, dung and pathways, was recorded in a hedge close to one section of the route (see confidential addendum) during surveys undertaken in October 2003. Given the high levels of badger activity within the survey corridor it is likely that woodland nearby may contain active setts.
- 10.37 The extensive network of hedges, small copses and field margins also provide good foraging habitat and transit routes for badger. During surveys it was evident that many hedges and field margins were regularly used as foraging routes as demonstrated by regular deposits of dung and snuffle holes.

#### *Bats*

- 10.38 It is highly likely that the riparian habitat recorded along both water courses (Target Notes 2 and 4) provide a feeding corridor for bats and mature trees lining the bank sides provide potential roost sites.
- 10.39 Bat roosts may also be present in other mature trees found in hedges crossed by the proposed route. These may be used as nursery roosts, for hibernation, as feeding perches or occasional roost sites. The adjacent hedges, woodland copses and field margins also provide potential feeding areas.

#### *Birds*

- 10.40 Woodland, scrub, trees, hedges and field margins surveyed throughout the route corridor provided nesting sites for common birds. Typical species recorded included blackbird, great tit, blue tit, long-tailed tit, dunnock wren and robin. Arable fields and their associated margins also supported a range of species including BTO listed species of national conservation importance such as lapwing, golden plover, fieldfare, golden plover, skylark, yellowhammer, and merlin.

10.41 Mature trees found in woodlands, hedges and fields are likely to provide perching posts and roost sites for raptors such as sparrowhawk, tawny owl, barn owl and red kite. Barn owl and red kite are specially protected species under Schedule 1 of the WCA and are known to occur locally within 2 km of the proposed scheme.

10.42 Riparian habitat along the two streams crossed by the proposed route provides important feeding and nesting habitat for a range of bird species. Those recorded during surveys along watercourses included species of conservation concern including; goldcrest, bullfinch and other more common species such as sparrow hawk, siskin and blue tit. The watercourses may provide habitat for kingfisher (a species specially protected by the WCA).

#### *Great crested newt*

10.43 No ponds were recorded within 500m of the proposed route. Therefore the Scheme would not affect any great crested newt populations, or their habitat.

#### *Water vole and otter*

10.44 Both watercourses that would be crossed by the proposed route provide dispersal corridors and temporary habitat for water vole and otter. There are records of water vole occurring near the weir on the River Ise near Burton Latimer and otter at Southfield Marsh Farm SSSI. Both locations are within 1.5 km of the proposed route.

#### *White-clawed crayfish*

10.45 The main River Ise has recent records of white-clawed crayfish but it is not likely that they occur in the two tributaries affected by the proposed route. Certain features such as the buttress roots of alder may offer limited refuge potential for crayfish but the silty substrate of both watercourses makes them generally unsuitable for the species and it is unlikely that they occur in the sections of stream affected.

#### *Local Biodiversity*

10.46 There were a number of habitats recorded during walkover surveys that are listed as priority habitats in the Northamptonshire BAP. These included rivers and streams, lowland mixed woodland, hedgerows and species-rich lowland grassland. In addition to legally protected species it is likely that local BAP species such as harvest mouse, brown hare, pipistrelle bat and grey partridge also occur with the survey corridor.

## **IMPACTS DURING CONSTRUCTION**

10.47 This section provides an assessment of the likely impacts arising from construction of the Scheme on key features and habitats. In many instances these include the habitat of legally protected species and this is also considered in the impact assessment on each habitat feature. Impacts during construction include:

- ◆ Temporary impacts such as increased noise from construction work;
- ◆ Impacts on protected species, as a result of disturbance or habitat loss;
- ◆ Permanent impacts such as loss and severance of habitats

### SSSIs

- 10.48 The proposed route would not result in any habitat loss from Southfield Farm Marsh SSSI (Figure 15). Indirect impacts arising from possible changes in local hydrology are unlikely, as the SSSI is separated from the Scheme by the Midland Railway Line. No adverse impacts arising from construction are predicted. Therefore the assessment of impact of SSSIs, according to TAG, would be neutral.

### County Wildlife Sites

- 10.49 Construction would not result in any direct habitat loss from any CWSs. However, it would sever Big Covert CWS from other areas of habitat nearby such as Ashpole Plantation and Cock-o-Roost Spinney (Figure 15). It would generally increase the degree of isolation of woodland habitat making the movement of wildlife such as birds, badgers, bats and other small mammals between woodland blocks more difficult.
- 10.50 Other impacts during construction on Big Covert are likely to consist of disturbance to birds during the breeding season resulting from an increase in noise levels from construction work. This may temporarily reduce the success of breeding birds within a certain distance of the Scheme and thus temporarily reduce the success of species in the local area.
- 10.51 Impacts CWSs may be characterised as negative, of intermediate magnitude, and the significance of this can be evaluated as being slight adverse according to TAG.

### Other habitats

#### *Arable and improved grassland*

- 10.52 Direct loss of habitat due to construction of the bypass would mainly result in habitat loss of and severance to arable land and small areas of improved grassland (near North Lodge) that are of some local importance for wildlife. In general this loss would usually only result in a negligible adverse impact on ecology. However, certain areas are of higher local ecological significance because they are used by birds which are nationally threatened and declining such as lapwing, golden plover, skylark and yellowhammer. In this instance, therefore, the loss and severance of arable habitat would be more significant and the assessment of farmland habitat loss is likely to be slight adverse according to TAG.

#### *Semi-improved grassland*

- 10.53 Construction would result in loss of and severance to a small area of semi-improved grassland close to the watercourse situated to the north of the cemetery (Target Note 2). This area provides an important stretch of riparian zone to the watercourse and provides habitat for bird species of conservation concern.
- 10.54 The significance of this impact is evaluated as being moderate adverse according to TAG. However, the impact of habitat loss of this area could be mitigated by appropriate management of other areas adjoining the watercourse and if so the assessment is likely to reduce to slight adverse.

### *Woodland*

- 10.55 Although there would be no loss of woodland habitat, construction would impede the movement of fauna such as badger and roe deer between other areas of woodland nearby. More generally, construction of the bypass would increase the degree of isolation of woodland habitat making the movement of wildlife between woodland blocks more difficult. There may also be disturbance to birds during the breeding season resulting from an increase in noise levels from construction work thereby reducing the success of breeding birds locally.
- 10.56 Habitat severance and increases in noise levels are likely to result in an intermediate negative impact on local woodland habitats and be assessed as being slight adverse according to TAG.

### *Hedgerows*

- 10.57 Most hedgerow sections that would be lost are managed hedges with poor structure for wildlife and are therefore of low ecological value. However such hedges form a largely unbroken network across local farmland and act as corridors facilitating the movement of wildlife, as evidenced by high levels of badger activity along many hedgerows. Construction of the proposed route would result in an increase in the fragmentation of the hedgerow network locally thereby restricting movements of wildlife.
- 10.58 Loss and severance of hedges during construction would constitute a negative impact of intermediate magnitude and would mainly affect sections of hedge that are of lower importance for wildlife. The significance of this can be evaluated as being slight adverse according to TAG.
- 10.59 However, some small sections of hedgerow that would be lost during construction are intrinsically valuable to wildlife because they possess features such as ditches, mature trees and small thickets.
- 10.60 Impacts on protected species using this habitat are predicted to be:
- ◆ Loss of mature trees in some areas which provide perching posts and potential roost sites for birds of prey and potential roost sites for bats;
  - ◆ Loss of intact hedges with mature growth which provide cover and are therefore more attractive to nesting birds;
  - ◆ Loss of a badger sett, due to the road alignment.
- 10.61 Sections of hedge containing such features would be retained wherever possible during construction but where losses are unavoidable the assessment of impact would be considered to be moderate adverse according to TAG. These issues are discussed further under the protected species heading of this section.

### *Watercourses*

- 10.62 The three streams and their associated bank side habitats act as important wildlife corridors and may provide habitat for protected species. Whatever the design of the crossings, there would be loss of bankside and marginal habitats. This would ultimately result in a lack of continuity of riparian habitat, which may impede the movement of protected species, particularly otter and water vole that may use these river corridors for dispersal. Depending on the scale and timing of works construction could result in disturbance to protected species during site clearance and construction.
- 10.63 White-clawed crayfish which are known to be present in the River Ise are vulnerable to declines in water quality, particularly when caused by a high sediment load and inappropriate stream management or in-channel works. This could be caused by sediment arising from in channel construction work on the tributary streams crossed by the proposed route. White-clawed crayfish are particularly susceptible to crayfish plague which maybe transferred into watercourses by personnel or machinery undertaking in channel works.
- 10.64 The impact of construction on the three watercourses is likely to be moderate adverse according to TAG because there would be direct impacts of an intermediate negative magnitude on features of high local importance for wildlife that may support legally protected species.

### **MITIGATION MEASURES DURING CONSTRUCTION**

- 10.65 No specific mitigation would be required in respect of the SSSI or CWS within the locality of the scheme. Specific measures that are required to mitigate impacts on protected species are described in the section below under separate headings, and cover mitigation for impacts during both construction and operation. Mitigation measures for impacts on habitats are described below.
- 10.66 The appointment of an ecological clerk of works will be necessary to provide day to day ecological advice and supervise habitat clearance and the installation of mitigation features such as badger fencing and tunnels.

### **Habitats**

#### *Farmland and field margins*

- 10.67 Clearance of farmland habitats which includes arable fields, any areas of semi-improved grassland and field margins would be timed to avoid the bird nesting season. This is discussed further under the birds heading of this section.

### *Woodland and scrub*

- 10.68 Although no woodland habitats would be lost due to site clearance, measures would be implemented to avoid disturbance to breeding birds, bats and badger that may occur in habitats nearby. This would include temporary fencing to limit access and thus disturbance to sensitive areas during construction. Such areas would be identified and delineated in advance of on site works by a suitably qualified ecologist. Appropriate use of badger/deer fencing and badger tunnels and underpasses would reduce the impacts of habitat severance on mammals.
- 10.69 Native species of local provenance would be used in structure planting and other landscaping around the new road to enhance and augment native tree and shrub communities locally. New structure planting would be contiguous with or link remaining blocks of woodland wherever possible in order to maintain habitat continuity.
- 10.70 The design of structure planting along the new road verges should reflect the presence of barn owl in the locality and be structured to discourage owls from hunting near the carriageway.

### *Hedgerows*

- 10.71 Where mature trees, hedgerow sections and field margins would be lost to development, partial retention is preferable to complete removal wherever possible. Mature trees should be pruned or pollarded rather than felled retaining key features such as cavities. Sections of hedgerow should be coppiced and the root masses replanted in gappy sections of hedge nearby. Where complete removal of mature trees or hedgerow sections is the only option then the timber should be retained and incorporated into new areas of structure planting as log and brash piles. Artificial roost structures would be provided for roosting bats if trees are to be felled which provide roost potential for bats.
- 10.72 Loss of mature trees and hedges cannot be compensated by replacement planting in the short to medium term as new planting does not provide features such as dead wood, cavities, levels of height and shade provided by mature trees. However, new hedges and structure planting would be used to maintain and extend links to other habitats and to increase the amount of tree cover locally and be contiguous with existing blocks of woodland, hedgerows and scrub. Overall it is anticipated that a greater length of hedgerow will be planted as part of the landscape design of the new road scheme than that lost under the development footprint. In addition, targeted replanting of existing defunct hedgerows nearby will be undertaken where practicable to ensure that the scheme contributes to local BAP targets.
- 10.73 Generally, movement of heavy plant during construction would avoid areas where trees and hedges that are to be retained. Sensitive areas would be identified and delineated in advance of on site works and the movement of staff and machinery restricted in these areas in order to prevent root compaction and accidental damage to trees and hedges.

### *Watercourses*

- 10.74 The crossings over the three streams would be a bridge or culvert that would be designed to minimise the loss of bank side habitat and ensure that there is continuity of habitat for the movement of wildlife. To this end it would incorporate ecological features where necessary, which would permit the movement of wildlife. For example, if the watercourse was culverted, a ledge or an additional pipe would be provided to an appropriate design (following guidelines set out in DMRB volume 10) above maximum flood water level to allow access to the wider catchment to otter and water vole during periods of spate. Artificial roost structures would be provided for roosting bats if trees are to be felled which provide roost potential for bats.
- 10.75 Riparian habitats adjacent to construction work would be protected from incidental disturbance by heavy plant and personnel by the delineation of exclusion zones where habitats would not be disturbed. Where bankside habitats would be affected, features such as mature trees, root systems, buttresses at water level, and sections of eroding riverbank that provide potential habitats for protected species would be retained, wherever possible.
- 10.76 Structure planting around the crossing would use species that are found along the brook, preferably of native provenance, and would link to the local hedgerow network and other linear features such as the railway embankment nearby.
- 10.77 In-channel engineering works would be kept to a minimum and avoid disturbance of habitat features such as tree roots which may provide habitat for white-clawed crayfish. All machinery and personnel entering the water would be cleaned and disinfected before working in and around the brook to prevent the spread of crayfish plague.
- 10.78 In general pollution control measures detailed in Environment Agency Pollution Prevention Guidelines, Works in, near or liable to affect watercourses (PPG5) would be implemented in order to minimise adverse impacts on water quality during construction work.

### **Protected Species**

- 10.79 Mitigation measures outlined in this section will be implemented in order to ensure that the construction and operation of road schemes complies with legislation relating to protected species. The relevant articles of legislation are the Wildlife and Countryside Act 1981 as amended by CRoW 2000, the Conservation (Natural Habitats &c) Regulations 1994 and the Protection of Badgers Act 1992.

#### *Badger*

- 10.80 Badgers and their setts are afforded protection through the Protection of Badgers Act 1992. It is an offence to wilfully kill or injure a badger or intentionally or recklessly damage, destroy or obstruct access to any part of a badger sett.

- 10.81 An active sett was recorded during a recent site survey that was located within 100m of the proposed route. Depending on the location and scale of activity, mitigation during construction may be required to prevent disturbance to or destruction of setts. Work within 30 m of a sett would need to be licensed by English Nature. Measures may require either temporary or permanent exclusion of badgers and relocation to an artificial sett.
- 10.82 Approximately six months prior to the start of construction work, the locations of all existing setts, areas with the potential to support setts and foraging paths within 500m of the proposed route would be surveyed.
- 10.83 Badger fencing and tunnels built to an approved design following the DMRB volume 10 would be used if appropriate to ensure continued access to habitats on both sides of the road. Culverts and over bridges provided to take public rights of way over the new road, would provide opportunities for badgers and other wildlife to cross the road safely. Access measures incorporating ecological features into culverts and over bridge designs would be implemented where appropriate. The locations where such measures would be implemented would be informed by the activity recorded during surveys and any additional information provided by the Northamptonshire Badger Group.
- 10.84 New planting within the Scheme and enhancement of the existing hedgerow network would contain tree species which provide food for badger, such as elder and crab which would mitigate the loss of some foraging habitat.

### *Bats*

- 10.85 All bat species and their roosts are protected under schedule 5 of the WCA and the Conservation (natural habitats &c) Regulations 1994. Bats may roost in the cavities of mature trees and can be present in nursery roosts between May and August and hibernate from November to March (inclusive). It should be noted that there is variability in these dates depending on seasonal variability and species. Therefore all mature trees with cavities that may contain bat roosts that are likely to be felled or pruned during construction of the new road would need to be surveyed at least six months in advance of clearance operations to check for the presence of bats. This would need to be undertaken by a licensed bat surveyor.
- 10.86 If a roost is found, felling of the tree would need to be timed to avoid the period when it is in use as a roost. For example; if a summer roost would be disturbed or lost then work should be undertaken during the winter. If a winter hibernacula would be disturbed or lost then work should be scheduled to occur in late summer.
- 10.87 If bats were found to be present, DEFRA would need to approve exclusion and issue a licence. If a bat roost is lost to construction of the road, alternative habitat would be provided. This may comprise bat boxes in adjacent woodland to mitigate the loss of mature trees, or something more substantial if a large roost site was lost.
- 10.88 Additional surveys to record habitat utilisation by bats along the two streams would also be undertaken in order to provide an assessment of habitat quality that would inform detailed mitigation proposals in respect of watercourse crossings.

### *Birds*

- 10.89 All nesting birds, their nests and eggs are protected from intentional disturbance during the breeding season under the WCA. Those species included in Schedule 1 such as red kite, kingfisher and barn owl are additionally protected from reckless disturbance.
- 10.90 Wherever possible habitat for breeding birds such as trees hedges and scrub would be retained and protected from incidental disturbance especially those providing resting places for raptors such as red kite and barn owl. Where mature trees in fields are to be lost then this would be mitigated by the provision of nest boxes for raptors and perching posts in hedges. Loss of nesting habitat for woodland birds would be mitigated throughout the Scheme by the provision of structure planting, replacement hedges and improvements to the local hedgerow network.
- 10.91 Any clearance work undertaken which affects any habitats for breeding birds (including habitats on watercourses, topsoil stripping on agricultural fields supporting ground nesting birds and scrub habitats) should be undertaken outside the bird-nesting season, which is 1 February to 31 August. Any clearance which cannot be undertaken outside of this time would be checked for breeding birds by a suitably qualified ecologist and, if appropriate, an exclusion zone set up so that nests are not disturbed.

### *Otter, water vole and white-clawed crayfish*

- 10.92 The three streams that would be crossed by the proposed route, provide suitable habitats for otter and water vole. Some features such as underwater root systems may support white-clawed crayfish. These species receive varying levels of protection under the WCA and otters are additionally protected by the Conservation (natural habitats &c) Regulations 1994. Their presence in the route corridor has not been recorded to date during walkover surveys undertaken for this assessment.
- 10.93 Information on these species would be updated prior to construction by further surveys which would be undertaken during the appropriate survey season to check for signs or presence of water vole and otter along the watercourse up to 1 km either side of the proposed crossing. All surveys would be undertaken by suitably qualified ecologists holding relevant survey licences.
- 10.94 Any features such as underwater tree roots and overhanging ledges which have the potential to support white-clawed crayfish that need to be removed during clearance would be checked prior to their removal. This would be undertaken by suitably qualified ecologist holding relevant survey licences. All machinery and personnel entering the water would be cleaned and disinfected before working in and around the watercourses to prevent the spread of crayfish plague. Such measures are especially important because the watercourses crossed by the proposed route are tributaries of the River Ise which supports known populations of white-clawed crayfish.
- 10.95 Survey information would be used to inform and add detail to the design of the crossings over the three streams. It would also provide information useful for the design of any surface water drainage.

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## IMPACTS WHEN OPERATIONAL

10.96 This section provides an assessment of the likely impacts on ecology once the proposed road becomes open to traffic. Operational impacts are taken into account in the overall TAG assessment.

### Increased noise

10.97 There would be a general decline in the quality of breeding habitat for song birds due to elevated noise levels and proximity of the Scheme to local woodlands including Big Covert CWS, Ashpole Plantation, Cock-o-Roost Spinney, and birds using surrounding arable fields for wintering and breeding. This impact may extend to species of conservation concern species such as bullfinch, turtle dove, skylark, yellowhammer and grey partridge.

### Pollution

10.98 Balancing ponds and watercourses where surface water may be discharged from the road may be adversely affected by fuel and oil contaminated water and salt. The effects of contaminated surface water runoff may include;

- ◆ Microbiological contamination of water supplies;
- ◆ Smothering of fish spawning gravels;
- ◆ Nutrient enrichment and eutrophication;
- ◆ Oxygen depletion;
- ◆ Toxicity to plant and animal life, including endocrine disruption in fish.

10.99 This would potentially lower the quality of habitats for wildlife and may affect legally protected species, for example kingfisher and water vole.

10.100 A reduction in air quality arising from vehicle movements may cause a decline in the range of mosses and lichens present in woodlands locally as some species are particularly sensitive to this.

10.101 Salt spray from vehicles during the winter months may affect the establishment of new habitats on embankments and roadside verges and may influence vegetation communities.

### Habitat severance

10.102 When in operation the road would continue to present a permanent barrier to the movement of wildlife, in particular birds and mammals. It is expected that there would be an overall rise in the mortality rate of some species locally due to road accidents, in particular mammals such as badger and roe deer that routinely cross roads.

10.103 Barn owl, which are known to be present locally feed along linear features such as hedges along road sides would also be at risk from road traffic accidents along the new road. The design of structure planting would mitigate some of these potential impacts by discouraging flight paths near the road edge.

10.104 Lighting of the new road Scheme may cause variety of ecological impacts, and include:

- ◆ Deaths of migrating birds caused by collisions with lighted vehicles;
- ◆ Disruption of bird behaviour caused by the false dawn of street lights;

- ◆ Deaths of moths due to their attraction to lights (possibly a significant factor in the recent decline in urban moth populations);
- ◆ Disruption of tree, shrub and plant functions that are controlled by day length (e.g. leaf fall and flowering);
- ◆ Disruption to time periods of mammal activity.

## **MITIGATION MEASURES WHEN OPERATIONAL**

### **Management of newly created habitats**

10.105 As new habitats such as structure planting, balancing ponds and grassland on roadside verges and embankments mature they would start to provide habitat for a range of fauna including nesting birds. Management and aftercare routines should reflect ecological objectives and avoid sensitive times for example the bird nesting season.

10.106 New habitats would be assessed three years after completion of the Scheme in order for management proposals to be formulated to increase their wildlife potential.

### **Noise**

10.107 No specific mitigation is recommended. However, noise attenuation provided for local settlements would reduce the impacts of noise on breeding birds locally.

### **Water pollution**

10.108 Reductions in water quality of watercourses and ponds receiving surface water run-off would be avoided by:

- ◆ The use of pollution control measures, such as oil interceptors, silt traps and balancing ponds, on all outfalls where emission is directly to the watercourse;
- ◆ The incorporation of small areas of reed growth where water discharges into balancing ponds;
- ◆ Ensuring that all maintenance work including soft landscape management conducted in or near water bodies close to the new road complies with guidance given in PPG 5 Works in, near or liable to affect watercourses.

### **Severance of habitats**

10.109 Measures implemented during construction such as the provision of badger tunnels and fencing would require regular inspection and maintenance in order to ensure their effectiveness. Road casualties should be logged and their locations recorded so that warning signs can be erected and speed restrictions applied if appropriate.

### **Lighting**

10.110 The extent of light pollution from road lighting can be reduced by implementation of the following measures:

- ◆ Designing light fittings to reduce light emitted above the horizontal;
- ◆ Positioning lighting properly and directing it downwards;

- ◆ Using only the necessary amount of lighting;

## SUMMARY

- 10.111 The impacts of development on each key ecological feature are summarised in the TAG tables given in Appendix A and a summary appraisal is provided in Chapter 21.
- 10.112 The majority of land within a 1km corridor centred on the proposed route is arable land of low ecological value. However, within this area there are key features of importance for wildlife including, broadleaved woodland, semi improved grassland hedges, ponds and watercourses. These features are listed as priority habitats within the Northamptonshire BAP. They also support legally protected species including badger, bats and barn owl.
- 10.113 The results of surveys undertaken in September 2002 and October 2003, supported by information gathered from NWT, EN, the EA and local wildlife interest groups, are sufficient to provide an appropriate ecological evaluation of the proposed route for Stage 3 DMRB.
- 10.114 No statutory or non-statutory sites of importance for nature conservation located within 2 kilometres of the proposed route would be directly affected by construction of the scheme. There would be no direct or indirect impacts on South Field Farm Marsh SSSI.
- 10.115 There would be some indirect impacts on Big Covert CWS which is located within 500m of the proposed route. There is likely to be an overall reduction in the value of the site for wildlife due to increased isolation arising from severance of interconnecting hedges and a reduction in the habitat quality for breeding birds. Taking into account mitigation that would be incorporated into the design, the proposed road would be likely to have a **slight adverse** impact on the ecological value of this site.
- 10.116 Construction of the proposed route would cause some direct impacts including habitat loss and fragmentation caused by severance of agricultural land, hedges, mature trees, scrub and watercourses. Some of these features provide important habitats for legally protected species and therefore the impacts arising from construction and operation of the road would be more serious. Taking into account mitigation that would be incorporated into the design, the proposed route would be likely to have a **moderate adverse** impact on the ecological value of these features.
- 10.117 The mitigation measures outlined in this report would offset some impacts on key ecological features and redress some of the loss and severance of habitats that adoption of the Scheme would cause, but there would be some residual impacts such as habitat severance that cannot be mitigated completely.
- 10.118 Therefore overall, the Scheme would be likely to have a **moderate adverse** impact on the ecological features identified in the assessment, mainly due to cumulative adverse impacts on features of local conservation value.

## FURTHER SURVEY

- 10.119 The following surveys would be required to inform the ecological mitigation design. These have not been undertaken to date due to seasonal constraints:

- ◆ A further survey of the three streams and their surrounding riparian habitat for water vole and otter and to check their use as feeding corridors for bats.

10.120 Approximately six months in advance of the commencement of construction the following surveys would be undertaken:

- ◆ A survey of all mature trees that possess the potential to support bat roosts;
- ◆ A survey to record changes in badger activity, the locations of existing setts, areas and areas within 30m of the route with the potential to support setts.
- ◆ Features such as underwater tree roots and overhanging ledges in watercourses would be searched for crayfish prior to any disturbance by machinery or personnel during construction.

## 11. HERITAGE

### INTRODUCTION

- 11.1 This document is an assessment of the likely impacts on the Cultural Heritage resource posed by the proposed construction of the A509 Isham Bypass. The assessment has been undertaken in accordance with Stage 3 of the Design Manual for Roads and Bridges, Volume 11, Section 3, Part 2, Cultural Heritage (1993).
- 11.2 The route runs through an undulating landscape of bolder clay plateaux and deep valleys formed by tributary streams within the catchment of the River Ise. Land use within the proposed road corridor is predominantly arable.
- 11.3 The proposed route lies within an area that was within the limits of Rockingham Forest during the Saxon and Early Medieval periods. There is evidence that prior to forestation the landscape was densely occupied from the prehistoric period onwards, evident from the vast numbers of cropmark sites within and in the vicinity of the proposed route. From the medieval period up until the 16th century large areas were cleared to make way from settlement and agricultural production. This route therefore has the potential to affect the sites and landscape relating to this succession of periods of occupation and development. It is clear that all further assessment and all archaeological work on the scheme must be undertaken within the context of this wider historic landscape.
- 11.4 Cultural Heritage resources that may be affected by the proposed route include both archaeology and built heritage. The resources therefore covered in the research for this report have included records of archaeological sites (both known, and as yet unknown), Listed Buildings, Scheduled Ancient Monuments, Conservation Areas, Historic Parks and Gardens and other designations relating to the historic use of the landscape such as Defence of Britain sites.
- 11.5 As part of this desk-based assessment, geophysical survey and fieldwalking have been carried out, and reported on, and trial trenching has been undertaken.
- 11.6 The aims of the assessment are to:
- ◆ identify the known Cultural Heritage constraints relating to the proposed bypass along the entire length of the route;
  - ◆ determine the potential for disturbing previously unknown remains in areas of archaeological sensitivity;
  - ◆ determine the value of the resource;
  - ◆ assess the impact of the proposed bypass on existing and potential Cultural Heritage resources and to make recommendations for any further investigation which may be required (e.g. additional geophysics, field walking, trial trenching etc.) to clarify the nature of the resource and potential impacts;
  - ◆ Propose mitigation measures which will reduce the effects of the scheme on the Cultural Heritage resource.

**METHOD OF ASSESSMENT**

- 11.7 This document is produced in accordance with the IFA Standards and Guidance for Desk-Based Assessments and in accordance with Stage 3 of the Design Manual for Roads and Bridges, Volume 11, Section 3, Part 2, Cultural Heritage (1993).
- 11.8 Information was obtained for a study area of 500 metres either side of the proposed route.
- 11.9 The following sources were consulted in February 2004:
- ◆ Northamptonshire County Council Sites and Monuments Record (SMR), for details of known archaeological and built heritage in the study area, any Historic Parks and Gardens, or other designations relating to Cultural Heritage and information relating to land use within the study area;
  - ◆ Northamptonshire Records Office for Historic Maps, Parish Records and other published and unpublished material;
  - ◆ The Historic Environment Officer for Northamptonshire County Council, Myk Flitcroft;
  - ◆ English Heritage for information on Scheduled Ancient Monuments.
- 11.10 Aerial photographs were not studied, but the NCC SMR includes cropmark plots from previous aerial photographic survey.
- 11.11 Historic Maps were studied to gain an understanding of the nature of historic land use to identify any previous disturbance within the proposed route corridor along the route.
- 11.12 A gazetteer of known archaeological and built heritage resources in the study area was compiled (Appendix I). All sites have been given a specific number for the purpose of this report (A NO). The locations of these resources can be seen in Figure 16.
- 11.13 An historical and archaeological background has been set out, together with a summary of key issues relating to the likely archaeological potential of the area, to provide a framework for further archaeological work in relation to the scheme. This forms a basic structure within which the historic landscape can be understood, and within which appropriate mitigation can be devised.
- 11.14 Fieldwork has been carried out, and is reported on below. Fieldwork reports are included as appendices to this report.

**CRITERIA FOR SIGNIFICANCE OF IMPACT**

- 11.15 Table 11.1 outlines the criteria for magnitude and significance of impacts which is used in the assessment of cultural heritage according to the TAG methodology.

**Table 11.1: Significance of Impacts for Cultural Heritage**

<b>Scale of impact</b>	<b>Criteria</b>
Large beneficial positive effect	<p>Potential, through removal of very damaging impacts, for significant restoration of historic resources</p> <p>Major contribution to govt policy on heritage</p> <p>Mitigate visual intrusion to re-establish integrity of sites of national or regional importance</p>
Moderate beneficial	<p>Potential through removal of discordant impacts for significant restoration of historic resources</p> <p>Contribute to Regional or Local policies for protection or enhancement of heritage</p> <p>Enhance existing historic landscape/townscape</p>
Slight beneficial effect	<p>Not in conflict with national, regional or local plans</p> <p>Proposals restore or enhance form, scale, sense of place of heritage resource through good design and mitigation</p> <p>Remove or mitigate visual intrusion allowing better appreciation of locally or regionally significant heritage features</p>
Neutral	<p>Proposals do not conflict or contribute to heritage protection policies</p> <p>Maintain existing character in townscape/landscape</p> <p>Have no appreciable impacts on heritage</p> <p>Combination of slight positive and negative impacts on locally significant heritage</p> <p>No severance or loss of integrity of historic landscape</p>
Slight adverse effect	<p>In conflict with local policies for protection of local heritage character</p> <p>Detrimental impact on local or regionally significant heritage assets</p> <p>Damage locally significant features for which adequate mitigation is proposed</p> <p>Poor fit with form, scale and patterns of historic landscape/townscape</p>
Moderate adverse effect	<p>Out of scale with scale, pattern or form of heritage resource</p> <p>Intrusive proposal in heritage context</p> <p>Conflict with local or regional heritage protection policies</p> <p>Damaging to nationally significant heritage assets, compromising integrity but not destroying it, and adequate mitigation proposed</p> <p>Major direct impact on regionally or locally significant heritage, substantially compromising integrity, but adequate mitigation</p>
Large adverse effect	<p>Major direct impact on nationally important heritage, through destruction or severe damage to integrity</p> <p>Moderate direct impact or compromise to setting of multiple nationally or regionally significant assets, seriously compromising integrity</p> <p>Major direct impact on regional assets, losing integrity and no adequate mitigation</p> <p>Highly intrusive damaging setting of heritage, seriously compromising context</p> <p>Serious conflict with government policy</p> <p>Strongly at variance with form, scale and pattern of historic landscape/townscape</p>

## **BASELINE CONDITIONS**

- 11.16 A preliminary review of the archaeology and history of the landscape within the study area has been undertaken. Where known sites fall within the study area they are referenced by A Numbers and shown on Figure 16.

## **Geology and Environment**

- 11.17 The route corridor traverses three plateaux at c. 75m AOD separated by two deep valleys formed by tributary streams within the catchment of the River Ise. The village of Isham is situated on plateaux to the east of the central section of the route corridor on higher ground at c.75m-90m AOD. The farming regime in the vicinity of the village of Isham is mixed with both arable fields and pasture. Away from the village in the northern and southern sections of the route corridor arable cultivation predominates.
- 11.18 The underlying geology of this area is varied. Estuarine material, chiefly of limestone with some silts and clay, occupies the highest ground and exists within the area of the route corridor to the west of Isham village. The village of Isham itself is situated on Northamptonshire Sand below the Estuarine Series material. The northern section of the route also runs through plateaux of Northampton Sand and the southern section runs predominantly through Upper Lias clays. The geologies within the deep valleys that cross the route corridor include Upper Lias Clays with alluvium in low-lying areas.

## **The Palaeolithic Period (c.500,000 BC - 8,000BC)**

- 11.19 Finds dated to this period are generally found within geological deposits that were formed in glacial and peri-glacial conditions. The flint and antler tools found within these secondary contexts are often reworked or re-deposited by glacial and/or fluvial action. Primary sites are generally found within low energy environments especially in locations closely associated with watercourses (Kidd, 2000).
- 11.20 The county appears to lie beyond the southern and eastern core of counties that are rich in Lower and Middle Palaeolithic finds ((Roe 1981) Kidd, 2000). Only 70 stone artefacts, predominantly Acheulian hand-axes dated to this period have been recorded from a total of 31 locations (Kidd, 2000). There are no known primary sites dated to the Palaeolithic period within Northamptonshire. The most significant concentration of Palaeolithic artefacts was identified along a 1 km stretch of the Nene Valley near Northampton approximately 14km southwest of the study area ((Wessex Archaeology, 1996) Kidd, 2000).

## **The Mesolithic Period (c.8,000-BC-4,000BC)**

- 11.21 Finds relating to the Mesolithic period in the county include axes, mace heads and flint scatters. Primary sites are generally located close to watercourses. Quarrying and development have removed large areas of the valley landscape along the Ise.
- 11.22 Primary sites have been identified on the Upper Ise Valley north of Kettering, on gravel islands and on areas of flood plain. These sites are located approximately 15km north of the study area (Clarke, 2003).
- 11.23 Evidence for forest clearance during the period, necessary for the construction of camps and the provision of firewood has come from carbon dating at Burton Latimer (Clarke, 2003). This site is located approximately 2 km northeast of the study area (PRN 1330562) (SP 8900 7500) (ADS).

### **The Neolithic Period (c.4,000-2,300 BC)**

- 11.24 The introduction of farming and its associated technological changes probably occurred around 4000 BC and quickly spread up the more favoured river valleys. Neolithic settlement was still based on a combination of mobility and temporary settlement, whereby inhabitants would move repeatedly through woodland following herds whilst clearing small areas for farming (Hunter & Ralston, 1999). The Neolithic saw the end of microlithic industries and the introduction of a toolkit dominated by large flint and igneous stone axes as well as arrowheads and large scrapers. The Neolithic also saw the appearance of pottery as a result of the development of food producing strategies (Cunliffe, 1993).
- 11.25 Ceremonial monuments are often the main indication of activity during this period, however within Northamptonshire monuments such as long mounds are few. The only certain example of a “classic” long mound is the excavated site at Redlands Farm, Stanwick approximately 10km east of the study area (Chapman, 2000). A second potential long mound was identified within a complex of Neolithic and Bronze Age monuments at Weston Cotton, Raunds approximately 12km to the east of the study area. Other monuments such as henges and causewayed enclosures are also few within the county however Cotton Henge which forms part of the West Cotton complex has been identified as a potential henge monument (Chapman, 2000). Neolithic monuments are believed to be territorial markers and therefore may indicate the extent of settlement ((Renfrew 1973) Cunliffe 1993).

### **The Bronze Age (c.2,300 BC-700BC)**

- 11.26 In the Bronze Age, metal first began to be widely used in Britain, possibly as a result of the increase in contact with Europe. However, various types of stone, particularly flint, remained in use long after metal became available. The Bronze Age saw the introduction of cremation and higher frequencies of burial in round barrows. Bronze Age society was divided into chiefdoms based around a largely agricultural economy.
- 11.27 Settlement evidence dated to the Bronze Age within the county is limited. The only known site is that of Stanwick near Raunds where the remains of two roundhouses and a boundary ditch were identified. This site is located approximately 5 km east of the study area. It is possible that a small percentage of the cropmark sites within the study area could be dated to the Late Bronze Age/iron Age transitional period (Chapman, 2000).
- 11.28 Burial monuments are the main indication of activity dated to this period. Within and in the vicinity of the study area two clusters of Round barrows have been identified from cropmarks visible on aerial photographs. The two clusters may represent small barrow cemeteries, one is located approximately 1 km southeast of the study area and the other is located close to the A14 intersection within the northern part study area (A No. 10, 11, 12 and 13).

### **The Iron Age 700BC – 43AD**

- 11.29 The Iron Age is characterised in this region by settlement stability and a large-scale organisation of the landscape, developments that began in the late Bronze Age. Settlement evidence is plentiful and diverse, ranging from individual farmsteads occupied by a single household, to hillforts holding much larger communities. Once established, a high percentage of settlement sites remained in use through the transition into the Roman period.

- 11.30 There is evidence from aerial survey, fieldwalking and excavation for dense Iron Age occupation on the bolder clay plateau adjacent to the River Ise. It is possible that a number of cropmark sites within the study area represent the remains of settlement dated to this period (A No. 1 and 2). Associated peripheral field systems potentially Iron Age in date, have also identified from aerial survey.
- 11.31 The increasingly complex societies of the Iron Age developed with the introduction and development of coinage, industry, and incipient urbanism. Hillforts and large-scale settlements in the later Iron Age became important centres for the articulation of trade and exchange, encouraged by the production of surplus resulting from the intensification of industrial production and technological innovations. Weaving and leather production were key industries of the Iron Age in Northamptonshire.

### **The Roman period (AD 43 – 410)**

- 11.32 The Roman period in Northamptonshire saw the continuation of intensively occupied settlements and the expansion of agricultural landscapes. Much woodland was cleared in the Roman period, to make way for the large expansion of settlement and agriculture (Foard, 2001). Late Iron Age and Roman settlements and fields covered vast areas in this period, and a large proportion of undated cropmark sites in the area are likely to be Iron Age or Roman.
- 11.33 Roman settlement has been identified within the village of Isham. Excavations were carried out in four locations, within the centre of the village by J.R Fox in 1966 (SP 8800 7300) (PRN 642229). The excavation at Manor House Farm revealed two ditches containing Roman pottery while the three other areas revealed evidence of Roman and Medieval settlement (Brown, 1969).
- 11.34 Increased agricultural production along with the pottery, charcoal and iron industries played a substantial part in the regional economy. These economies were greatly assisted by the construction and use of extensive road networks, and the foundation and development of many local market centres (Cunliffe 1993). The main towns in Northamptonshire during this period include Wellingborough, Northampton and Kettering. A road linking the two towns may have passed through the Roman settlement identified at Isham. This route may have connected with Watlington Street in the south and a second Roman Road in the north, both passing northeast-southwest through the county. At the end of the Roman period, settlement generally shifted once more back to the river valleys (Cunliffe 1993).

### **The Early Medieval Period AD 410-1066**

- 11.35 Transition from the Roman period into the Saxon period is less distinct in the area than from the Saxon to the later medieval period, in terms of use of landscape. Early Saxon settlement activity in the area is generally concentrated along the main River Valleys such as the Nene. Areas away from the river valleys saw the regeneration of woodland. The limits of the study area lie within what became known as Rockingham forest (Foard 2001).

- 11.36 There is limited archaeological evidence for the continuity of settlement sites between the Romano-British and Anglo Saxon periods. However, historical evidence from the Ramsey Chronicle shows that the manor of Isham was held in Saxon times by Earl Brithnoth and that it was given by him to 'the Abbey', witnessed by King Edgar in 974 (VCH 1937). The re-occupation, of these sites on a large scale may have occurred as part of the late Saxon re-planning whereby small farmsteads and hamlets began to develop into more nucleated settlement within an open field system. It is also possible that around this time the village received the name Isham as the word Ham is Saxon derived (VCH 1937).

#### **The Medieval Period AD 1066-1547**

- 11.37 Post-conquest the rural landscape was again quite densely populated. The area was predominantly agricultural between the 10th and 13th Centuries but with industrial activity persisting and developing in forested areas to supplement the agrarian economy. Other industries of the period in the area included the production of building stone, lime burning, tanning, and pottery production. In the 13th century Wendleburie (Wellingborough) and Cateringe (Kettering) became important market centres, with this came prosperity for the surrounding villages, evident by further expansion of population and cultivated land.
- 11.38 The village of Isham was recorded in the Domesday Survey at which time the local economy was predominantly agricultural. There is record of a mill in the village (A. No 7) which was rented by the occupants. The Manor of Isham was located southwest of the current village and was known as Over Hall (VCH 1937). On the site of the manor now stands Manor Farm.
- 11.39 Isham lay within the boundary of Rockingham Forest, which lay between the Welland and Nene, wholly within Northamptonshire. The area supported a range of industrial production, in particular an important iron industry, based upon the local ores, and fuelled by a substantial charcoal industry (Foard, 2001). Areas of the Forest were managed for the rearing and hunting of deer, which had been the primary purpose of the establishment of areas under forest law and remained an important factor restricting woodland clearance throughout the medieval period. It is possible, although not proven that a deer park existed close to the Manor of Isham which was located southwest of the current village and was known as Over Hall, which is located at Manor Farm (A No 36).
- 11.40 From about 1350 a steady decline set in, with abandonment and shrinkage of settlement largely due to the migration of populations to employment centres such as Wellingborough. There is evidence of shrinkage from earthworks within and around the village of Isham.

#### **The Post-Medieval Period AD 1547 – 1901**

- 11.41 The Post-medieval period saw the continuation of an agricultural landscape within the study area. The villages were much reduced in size as people continued to migrate to employment centres and subsequently Wellingborough began to expand.
- 11.42 The clearance of woodland continued even in areas which escaped medieval clearance. The decline in requirements for hunting parks and in the iron and charcoal industries meant that there was no longer use for woodland in the region (Foard 2001).

### Designated Sites within the study area

- 11.43 There are no Scheduled Ancient Monuments within the study area.
- 11.44 The centre of the village of Isham is designated as a Conservation Area. Parts of the villages of Burton Latimer, Pytchley and Finedon are also designated as Conservation Areas.
- 11.45 There are total of 22 listed buildings in Isham and additional listed buildings in Orlingbury, Finedon and Pytchley. Great Harrowden Hall and its formal gardens are Grade I listed. The grounds of Great Harrowden Hall, which include a golf course, are included in the Register of Historic Parks and Gardens.
- 11.46 Archaeological Sites, as Listed in the Sites and Monuments Record, are reviewed below :

#### *Bronze Age*

- ◆ A number of ring-ditches were identified from an early aerial survey in the area of the A14 Intersection (SMR 3794) (A. No 9, 10, 11, 12, 13).
- ◆ Cropmarks were identified through aerial survey in an area where worked flints dated to this period were recovered during fieldwalking in the early 1990's (SMR 3627) (A. No 17).
- ◆ A ring ditch identified through aerial survey lies in the northwest part of the study area (SMR 1504) (A. No 18).

#### *Roman*

- ◆ Pottery sherds of this date were recovered from an area west of Isham village (SMR 3623) (A. No 8).

#### *Post-medieval*

- ◆ Documentary evidence exists for a post-medieval mill site (SMR 6390) (A. No 7).
- ◆ The foundations of a structure identified during fieldwalking in the northwest part of the study area (SMR 6853) (A. No 14), possibly relating to a ruined medieval building.

#### *Modern*

- ◆ The site of a World War II Military Roadblock lies to the west of Hill Top. The monument is no longer extant (SMR 7455) (A. No 6).

#### *Undated*

- ◆ Pit alignments and enclosures suggest potential prehistoric settlement, as identified through aerial survey located to the southwest of Isham (SMR 3625) (A. No 4).
- ◆ Enclosures of unknown date identified through aerial survey located to the north west of Hill Top (SMR 3616) (A. No 1).
- ◆ Ditches of unknown date identified through aerial survey located to the north west of Hill Top (SMR 1395) (A. No 3).
- ◆ Enclosures identified through aerial survey (SMR 3618) (A. No 5).
- ◆ Enclosures and ditches identified through aerial survey to the east of Hill Top (SMR 3615) (A. No 15).

- ◆ Enclosure identified through aerial survey (SMR 3626) (A. No 16).

### Historic Map Regression

11.47 A number of maps were consulted during this study. These comprise - County Maps of Northamptonshire dated to 1791 and 1827, a field name map (post-Enclosure but otherwise of unknown date), and the 1st edition Ordnance Survey Map. These maps were studied to gain an understanding of the continuity of land use from the earliest to the latest date, to characterise changes in landscape use and to identify features of each period that are no longer extant.

#### *Map of field names in the Parish of Isham*

11.48 A copy of a map showing the enclosed fields of the parish listed by name accompanies the Inclosure Map held by the Northamptonshire Record Office. The map covers the area between the brooks north and south of Isham. The date of this map is unknown although it clearly post-dates the Enclosure Act of 1779. The map indicates that there were limekilns in the fields to the north-west of Isham, and evidence of occasional activities may survive in this area.

#### *The Bryants Map of 1827*

11.49 The Bryants Map shows an area northwest of Isham called Stone Pits with a number of annotated anomalies possibly representing quarry pits. There is no evidence of settlement in the area of present day Hill Top.

#### *The 1st edition O.S. map 1887-9*

11.50 A number of features (A No. 19-34) were identified from the study of the 1st edition map, discussed below by type.

11.51 A number of agricultural structures are illustrated within the study area. At A No. 27 A small roofed structure with a small adjacent enclosure is marked immediately to the north of a rectangular copse. The structure probably represents a sheepfold or a field barn. From the modern map it appears no longer to be extant. Three roofed structures around a yard and an access track (A No. 32), is marked to the west of the Willesborough Road. The buildings are likely to have been farm buildings and are no longer extant. Two corn mills, one at Isham (A No.33), and one at Burton (A No. 34) lie within the study area and while they will not be directly effected by the scheme, their presence in the study area illustrates the nature of agriculture in the area as a whole.

11.52 A brickworks at Hill Top marked on the first edition map (A No. 19) appears to have had a substantial kiln, and it seems likely that the adjacent fields would have been subject to extraction for brick earth.

11.53 There are two fords marked on the first edition on the main road in to and out of Isham. To the south of the village at A No. 31 is a ford over the Ise Brook with a clear sunken lane illustrated on both sides. To the north of the village at A No. 30 is a ford on the Wellingborough Road on a tributary of the Ise. A spring at Hill Top (A No. 21) may have provided a focus of settlement as a ready water supply at a prominent location.

- 11.54 There are a number of field boundaries marked on the first edition map which are no longer extant. One of these (A No. 23) is sinuous and probably reflects the inverted 'S' shape of a medieval ridge and furrow field system. There are two groups of field boundaries to (A Nos. 25 and 26) that appear typologically to date to the enclosure period, and three boundaries or boundary groups (A Nos. 20, 24 and 28) which typologically appear to date from enclosure and later.

### Previous Archaeological Work

- 11.55 Cropmarks identified in previous aerial photographic surveys are listed as SMR entries within the GIS based system held at the NCC SMR, and are listed in Appendix I.
- 11.56 An Archaeological Watching Brief was carried out along the A14 road corridor to the north of the proposed route between 1989 and 1994 by Northamptonshire Archaeological Unit. Finds and sites of all periods from the Mesolithic to Modern were observed and recorded (Soden, I & Dix, B. 1995).
- 11.57 A Desk-Based Assessment was undertaken for the proposed A509 Isham Bypass in 1992 (Steadman, S. 1992). A total of 27 sites were revealed along the bypass routes, 18 of which were identified as cropmarks on aerial photographs. A supplementary report was also produced for four alternative routes for the Isham Bypass in 1992. A manor, Roman and medieval settlement remains and an undated cropmark were identified (Shaw, M & Steadman, S. 1992). The study area includes the proposed route corridor presently being assessed, and those sites identified are included in this assessment.
- 11.58 In 1996 a programme of fieldwalking and geophysical survey was undertaken along the line of the proposed A509 Isham Bypass by Northamptonshire Archaeological Unit. This proposed route passed to the east of Isham and therefore the fieldwalking and geophysical survey were outside the presently proposed route corridor. Three sites were identified Romano-British farmstead with associated features and two finds scatters one of Iron Age pottery and the other Saxon (Shaw, M & Holmes, M. 1996).
- 11.59 A trial excavation and fieldwalking programme were undertaken by Northamptonshire Archaeological Unit in 1998 in advance of the proposed construction of a golf course at Pytchley. The site was in an area where known cropmarks had previously been recorded. The trial trenches revealed a number of ditches, pits and gullies. During fieldwalking a number of worked flints of Neolithic/ Early Bronze Age date were recovered and over a hundred sherds of Roman pottery collected. It was concluded that the pottery finds suggested that the cropmark complex was of a Roman date (Jennings, R. 1998). This site is located over 500 metres to the northwest of the proposed route corridor.
- 11.60 Excavations were carried out in four locations within the village of Isham by J.R Fox in 1966. The excavation at Manor House Farm, Isham revealed two ditches containing Roman pottery. The three other areas uncovered Roman and Medieval settlement (Fox, J.R. 1976). The identification of Roman settlement within Isham Village approximately 500 metres to the east of the proposed route corridor and the discovery of finds scatters of Roman pottery (SMR 3623) (SP 8780 7390) to the west heightens the potential for Roman settlement activity within the route corridor itself.

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## SUMMARY OF ARCHAEOLOGICAL RESOURCES WITHIN THE ROUTE CORRIDOR

- 11.61 Based upon the results the desk based work, there are nine archaeological sites listed on the SMR that will be directly affected by the proposed scheme. These are shown on Figure 16 :
- ◆ A No. 1. Some outlying elements of a series of cropmarks are cut by the scheme.
  - ◆ A No. 2. Some outlying elements of a series of cropmarks are cut by the scheme.
  - ◆ A No. 3. Some outlying elements of a series of cropmarks are cut by the scheme.
  - ◆ A No.6. The line of the road to the south of the scheme appears to cut the remains of a WWII military roadblock.
  - ◆ A No. 7. Features associated with brickworks near Hill Top.
  - ◆ A No. 23. Possible medieval field boundary.
  - ◆ A No. 24. Post medieval field boundary.
  - ◆ A No. 25. Post medieval field boundary
  - ◆ A No. 26. Post medieval field boundary
- 11.62 Furthermore, based on the understanding of the resource in the study area derived from the historical background above, nearby known sites, and in relation to previous archaeological work carried out in the vicinity, the potential for buried archaeology to be found on the route is considered to be high.
- 11.63 Archaeological remains lying within the footprint of the scheme are likely to be of regional or local importance.
- 11.64 The archaeological potential of the footprint of the scheme is given below by period:

### Prehistoric

- 11.65 Evidence of Bronze Age funerary monuments (barrows) to the north of the site on a slope to be climbed by the proposed route may suggest further archaeological deposits of the period and perhaps settlements associated with the barrows.
- 11.66 The cropmarks to the north-west of Hill Top appear typologically to be Iron Age in date and outlying elements of this settlement are conjectured to run into the footprint of the scheme.
- 11.67 Colluvium and alluvium in the valleys of the two stream channels that cross the scheme footprint may mask old land surfaces or features from the prehistoric period.

### Roman

- 11.68 The cropmarks to the west-north-west of Hill Top appear typologically to be Iron Age in date and outlying elements of this settlement are conjectured to run into the footprint of the scheme.
- 11.69 A Roman settlement identified at Isham and the possibility of a Roman road running through Isham between Kettering and Wellingborough significantly enhance the potential for Roman deposits to be present within the scheme footprint.

### Early medieval

11.70 Little is known of the Saxon period in the area, but a manor of Isham is known in the late Saxon period (probably located to the south and west of the modern village core), indicating a potential for significant Saxon deposits to be located within the footprint of the proposed route. If found, any information relating to the Saxon period would substantially enhance the record of Saxon activity in the area.

### Later medieval

11.71 The village of Isham is known to have existed and is recorded in the Domesday book, and there is therefore a significant potential for the discovery of archaeological deposits of the period. In the vicinity of the current village, this potential is enhanced by the location of the core of the medieval village to the south west of the current core, and therefore closer to the footprint of the scheme.

### Post-medieval

11.72 The potential for the scheme footprint to contain deposits from the post medieval period is based chiefly upon knowledge of the former brickworks at Hill Top which may have had an effect on the immediate landscape, and from agricultural features such as field boundaries and field barns, also known from historic maps.

11.73 In order to mitigate the impact of the scheme on any archaeological remains, a clearer understanding of the nature, extent and significance of buried remains along the route itself is required. A phased evaluation strategy has been completed and is described below.

## RESULTS OF ARCHAEOLOGICAL FIELDWORK

### Geophysical Survey

11.74 A geophysical survey was undertaken by Northamptonshire Archaeology in April 2004.

11.75 The survey consisted of two parts, an initial gradiometer line scan on a 20m grid using an FM256 Fluxgate Gradiometer which provided a good overview of anomalies along the proposed route corridor. Any anomalies identified were subject to a more detailed survey using the same surveying equipment to analyse any inform the trial trenching strategy.

11.76 Anomalies were identified during the initial reconnaissance survey mainly in the southern half of the scheme near a known area of cropmarks. The anomalies are potentially related to cropmark sites (SMR 3616) (SMR 3617) (A. No's 1 and 2). The programme for more detailed survey included a 2 hectare area where the anomalies lie within the route corridor. Three additional areas also yielded anomalies – Areas A, C and G on Figure 17.

### Fieldwalking Survey

11.77 An initial reconnaissance survey was carried out along the whole of the survey corridor in order to locate sites for a more intensive field walking survey. However, due to the lack of dense scatters found during the initial reconnaissance survey as well as due to problems of visibility (due to crop growth) it was decided not to re-walk the route. The results of the reconnaissance survey are shown in Figure 16.

- 11.78 Four main finds scatters were identified within the proposed route.
- ◆ Roman and medieval within area A (see figure 17) at Hill Top.
  - ◆ Another Roman and medieval spread to the north bank of the Ise Brook (Area D),
  - ◆ Two areas of Roman, Saxon and medieval to the west of Isham (E and F)

### **Trial Trenching**

- 11.79 A programme of trial trenching evaluation was carried out during September and October 2004. The locations of the trenches can be seen in Figure 4. The trenches were placed to examine the nature, extent and significance of known sites as well as areas of potential identified by fieldwalking and geophysical survey. Trenches were also positioned in the alluvial areas where any archaeological features might have been masked. Fifteen trenches (Numbers 54-68) were reserved to examine the five areas of additional geophysical survey, targeted on potential anomalies. In total, sixty-eight trial trenches were excavated along the route corridor under continuous archaeological supervision, using a mechanical digger fitted with a 2 m-wide toothless ditching bucket. All trenches were nominally 30m long, although for practical reasons lengths varied from approximately 18m to 36m.
- 11.80 The spread and location of trenches were agreed with the Northamptonshire County Council Historic Environment Team Leader, Myk Flitcroft.
- 11.81 Fields crossed by the road corridor were identified by letters, following the system adopted in the earlier stages of fieldwork. The rationale behind the positioning of the trenches is explained in the table below, a summary of evaluation results is also given.

**Table 11.2: Trial Trench Locations**

Field	Trench	Reason for Trenching	Results
<b>B</b>	54-56 47-49	Apparently archaeologically sterile area. Trenches located to test this assumption	No archaeological features or finds were recorded
<b>C</b>	30, 31 37-40	A complex of rectangular enclosures and a possible trackway in the southern part of the field, and part of an oval enclosure and other cropmarks in the northern part. One or both sites probably extend into Field D. Unknown date	<p>T30: a large E-W aligned ditch which corresponded closely to a long curving cropmark feature which may have defined a large enclosure.</p> <p>T39 – A large ditch aligned SE-NW yielded no finds. Environmental analysis revealed the fill to contain the remains of cereal and weeds. Another ditch, on a more southerly alignment, was found to contain a near complete early-middle Saxon pottery vessel. Occasional wild seed remains were recovered from a soil sample.</p> <p>Other ditches and gullies recorded in Trenches 31, 37 and 38 did not yield any finds, but were not discounted as being archaeologically sterile.</p>

<b>D</b>	32-36 41-46	Possible extension of sites in Field C extending into field.	<p>T35: Targeted on a substantial cropmark enclosure. Two section of a curvilinear ditch were revealed, which cut into solid bedrock. No finds were recovered. Also recorded was a large pit (2.05m diameter, 0.23m deep), no finds were recovered but charcoal was present.</p> <p>T33: a pit was recorded (1.1 m wide, 0.53 m deep). No finds were present.</p> <p>T42 &amp; 43: ditches containing Iron Age pottery were recorded. Also recovered was a tooth fragment, and soil samples were found to contain moderate remains of cereal, charcoal, weeds and chaff.</p>
<b>E</b>	28 & 29	Parallel cropmark ditches aligned SE-NW. Unknown date and significance	No archaeological features or finds were recorded
<b>F</b>	63-68	Apparently archaeologically sterile area, trenches were excavated to test this assumption	T66 & 67: features interpreted as furrow bases were recorded. No finds were present
<b>I</b>	17-27 50,51	Scatter of Roman and medieval pottery was recovered during fieldwalking. A single intense anomaly, possibly a buried kiln, was recorded during the geophysical survey. Trenches 50 and 51 were excavated to test deep alluvial deposits by the river.	No archaeological features or finds were recorded

<b>J</b>	12-16	Sherds of Roman pottery recorded. Located just west of the road corridor. Of unknown quantity and significance.	No archaeological features or finds were recorded
<b>L</b>	3-11 52, 53 60-62	Apparently archaeologically sterile area, trenches were excavated to test this assumption	T6,7 and 9: gullies and ditches were recorded, which contained no finds and remained undated
<b>N</b>	1,2 57-59	Apparently archaeologically sterile area, trenches were excavated to test this assumption	T59: a ditch was recorded, no finds were present

- 11.82 Archaeological features were present in 16 of the 68 trenches excavated. In general, the distribution of features corresponded closely with the areas of archaeological potential identified in the earlier stages of evaluation, particularly the edges of the cropmark complex north of Hilltop Road. Archaeological features were discovered in quite restricted areas, mainly among and immediately east of the known cropmark complex north of Hilltop Road (Fields C and D), and on the ridge north-west of Isham in Field L. There was virtually nothing of archaeological significance elsewhere. The targeted cropmarks in Fields B and E did not appear to have been caused by archaeological features.
- 11.83 While many of the features in Fields C and D were without finds and remained undated, they would generally appear to be related to the cropmark/geophysical complex and can be assumed to be archaeologically significant. Those in Fields L and the single ditch in Field N, however, are less obviously archaeologically significant. Some of the features identified here are likely to be post-medieval field boundaries.
- 11.84 The character of the remains along the route therefore appears to be ditches and pits associated with the outer extents of Iron Age or Saxon settlement. Finds recovered from the settlement remains in Fields C & D included Iron Age, early-middle Saxon and medieval pottery. Scatters of pottery from the Roman and medieval periods are also present, although there is no evidence for them being associated with settlements from this period, and they could well be present as a result of manuring of the fields in the past. Of those remains identified, none are considered to be of national importance. Iron Age settlement of this nature is fairly common in the region, Saxon settlement is not common but based on the evidence obtained through the evaluations it is not believed that extensive nor complex Saxon remains exist within the route corridor. Furthermore the evaluation showed that the features that exist within the corridor have been heavily truncated by ploughing and the acidic nature of the soil will have led to poor survival of organic remains.
- 11.85 The evidence of settlement in Fields C and D and other activity in Fields I, J and L are considered to be of regional importance due to their contribution to the understanding of the historic development of Northamptonshire.

- 11.86 Other remains along the route consist of scatters of Roman and medieval pottery found during fieldwalking, which are likely to be associated with previously recorded Roman and medieval settlement within Isham. Also recovered from fieldwalking and trial trenching were several undiagnostic prehistoric flint artefacts, which suggest small scale settlement activity in the area.
- 11.87 Trenches 50 and 51 were excavated in Field I to test whether alluvial deposits had masked any archaeological features. These trenches encountered nothing of archaeological significance.

## IMPACTS DURING CONSTRUCTION

### Impacts on Archaeological Remains

- 11.88 An archaeological resource can be affected by a road scheme in a number of ways: through the removal of material during works; the destruction to sensitive deposits caused by the presence of heavy plant; and the alteration of stable ground conditions which may lead to degradation of the quality and survival of buried archaeological remains.
- 11.89 Equally, the built heritage can be affected by development through possible demolition or loss of part of a structure or its grounds; increased visual intrusion, noise or vibration; changes in the setting of buildings; severance from linked features such as gardens or outbuildings, or through the loss of amenity value.
- 11.90 There will also be an impact on the quality of the historic landscape, where a development bisects or crosses over existing topographic, natural or historic features. The impacts of the road on the historic landscape is discussed in 'cumulative impacts' below.
- 11.91 The methodology for assessing the importance of archaeological remains, the scale of impact, and calculating the significance of effect is set out below.
- 11.92 This scheme will affect the archaeology in the following ways:
- ◆ By the removal of ground for the cutting of the road corridor in Fields B, C, D, F, I, J & L
  - ◆ By the burial of archaeological remains under embankments in Fields B, G, F, H, I, L, M & N

### CRITERIA OF MAGNITUDE AND SIGNIFICANCE OF IMPACT

- 11.93 In order to assess the *magnitude* of impact of the new road a grading system has been devised:
- ◆ **Substantial impact:** removal of more than 75% of the area of known or estimated deposits or features;
  - ◆ **Medium impact:** removal of between 25% and 75% of the area of known or estimated deposits or features;
  - ◆ **Small impact:** removal of less than 25% of the area of known or estimated deposits or features
- 11.94 The magnitude of non-physical impacts, such as impacts on the settings of features are discussed and assessed on a site by site basis.

- 11.95 The *importance* (or value) of each site has been measured using the Secretary of State's criteria for Scheduling Ancient Monuments. The criteria (period; rarity; documentation; group value; survival/condition; fragility/vulnerability; diversity; potential) were used to determine whether the resources within the development corridor are of National, Regional or Local importance.
- 11.96 By combining the *magnitude* of the impact of the proposals and the *importance* of each resource and taking into account mitigation proposals, an assessment can be made of the *significance of the effect*, defined as being *large beneficial, moderate beneficial, slight beneficial, neutral, slight adverse, moderate adverse, or large adverse*.

### Designated Sites

- 11.97 There will be no impacts on Scheduled Ancient Monuments, Listed Buildings or Historic Parks and Gardens within the scheme footprint.
- 11.98 The Isham Conservation Area to the east of the central section of the route is largely shielded from the line of the proposed route by a low rise, and it is not considered likely that there will be an adverse effect on it's setting.

### Undesignated Sites, identified through desk-based assessment and archaeological fieldwork

- 11.99 The following table summarises the impacts and effects of the scheme on the undesignated cultural heritage resource. Provisions for mitigation are described in more detail in Chapter 6.

**Table 11.3: Impacts and Effects on Undesignated Cultural Heritage Resource**

Site	Magnitude of Impact	Importance	Mitigation	Significance of Effect
<b>A No. 1.</b> Field C: Possible settlement remains dating from the Late Iron Age or Early-Mid Saxon period	Medium	Regional	Excavation	Moderate adverse
<b>A No. 2.</b> Field C: Possible Late Iron Age/Early-Mid Saxon settlement remains	Medium	Regional	Excavation	Moderate adverse
<b>A No. 3.</b> Field D: Possible Late Iron Age settlement remains	Small	Regional	Excavation	Moderate adverse

<b>A No. 37.</b> Field C: Possible Iron Age/Saxon settlement site	Substantial	Regional	Excavation or preservation in situ	Moderate adverse
<b>A No. 38.</b> Field L: Possible post-medieval or earlier field boundaries	Substantial	Regional	Excavation	Moderate adverse
<b>A No. 23.</b> Field I: Concentration of past activity recorded during fieldwalking	Small	Local	None needed	Neutral
<b>A No. 24.</b> Field J: Concentration of past activity recorded during fieldwalking	Small	Local	None needed	Neutral
<b>A No. 25.</b> Field L: Concentration of past activity recorded during fieldwalking	Small	Local	None needed	Neutral

### Cumulative impacts and impacts on historic landscape

11.100 The road will have a medium impact on the surrounding landscape, caused by the bisection of the field systems, and the combined loss of a number of archaeological sites at once. There will be some loss of historic landscape features, but the open nature of the landscape means that few boundaries or ancient partitions (*1<sup>st</sup> edition OS Map 1887-1889 and Figure 1*) will be lost.

### MITIGATION MEASURES DURING CONSTRUCTION

11.101 As described above, the scheme will require the removal, at least in part, of remains of potentially regional importance, but not of national importance. Furthermore, based on the field evaluation results, it is considered that the condition of these remains is poor due to the acidic nature of the soils and the fact that these fields have been under plough for at least 100 years, possibly more.

11.102 PPG 16: Archaeology and Planning states that the desirability of the preservation of archaeological remains and their setting is a material consideration within the planning process (paragraph 18). PPG 16 provides a presumption in favour of the physical preservation of nationally important archaeological remains (paragraph 8), and that where preservation *in situ* is not justified it is reasonable for planning authorities to require the developer to make appropriate and satisfactory provision for excavation and recording of remains (paragraph 25).

11.103 In this instance it is highly unlikely that remains of national importance survive within the road corridor. Those remains that do survive are not in good condition due to the ploughing and acidic nature of the soils; they are outlying and dispersed with few finds; and they are not part of a complex and dense network of features. Based on this it is considered that preservation *in situ* is not an appropriate mitigation strategy for this development.

11.104 Furthermore, it has been identified in *The East Midlands Archaeological Research Framework Project (English Heritage/ULAS, 2004)* that given the current paucity of excavated evidence for the early-middle Anglo-Saxon period in Northamptonshire, a high priority is for the extensive excavation of a number of early-middle Saxon settlements, wherever they may be located, to establish a wider range of evidence of settlement character.

11.105 Therefore, the proposed mitigation for the scheme is:

- ◆ **Fields C and D:** Full excavation within the extent of the features identified through desk-based assessment and field evaluation. This will be based on a full project design which will aim to answer some of the questions raised by *The East Midlands Archaeological Research Framework* – in particular in the studying of the nature of sedentary settlement patterns in the Late Iron Age; and in the case of Early-Middle Saxon settlements to look in more detail into their origin and development from this period into the medieval.
- ◆ **Fields I, J and L:** Watching brief during initial construction works in areas where archaeological features were recorded, and where fieldwalking evidence suggested some greater concentration of past activity even though earth-cut features were not recorded in the trial trenching.
- ◆ **Historic landscape** – mitigation in liaison with landscape architects will be undertaken, to integrate the scheme into the surrounding landscape and reduce visual impact through sensitive landscape design.

11.106 The mitigation strategy outlined above has been approved by Myk Flitcroft, Northamptonshire County Council Historic Environment Team Leader.

11.107 The overall effect of the Isham Bypass on the cultural heritage resource has been assessed as being **moderate adverse**, prior to implementation of mitigation measures.

## IMPACTS WHEN OPERATIONAL

11.108 The Scheme would remove significant volumes of through traffic from the existing route which passes through the centre of Isham Conservation Area. This will be to the benefit of the area and the older buildings within it, some of which are listed.

## **SUMMARY**

11.109 The proposed development would overall have a moderate adverse impact on the cultural heritage (prior to the undertaking of mitigation measures), taking into account the proposed removal of features and sites of regional significance. This overall impact will be reduced to **slight adverse**, based on the principle that full investigation and recording of archaeological information where remains cannot be preserved in situ, forms part of the mitigation strategy.

## 12. NOISE

### INTRODUCTION

- 12.1 This chapter considers the potential noise effects which would result from the proposed Isham Bypass on the noise environment of nearby residential properties within the study area. The effect of the redistribution of traffic on properties in the vicinity of the existing wider road network is also considered where significant.
- 12.2 Changes to the noise environment have been calculated based on traffic flow data, including percentage of Heavy Goods Vehicles (HGVs) and average vehicular speed, as well as characteristics of the study area such as road gradients, ground type and contours, screening and property counts.
- 12.3 Three-dimensional computer models of the proposed scheme and previously assessed wider study area have been generated in order to predict indicative future noise levels and to identify changes from the future Do Minimum situations.
- 12.4 In the current assessment it was requested that existing segments of the A43 between Northampton and Kettering and associated roads were also analysed. Due to time constraints and lack of detailed topographical information, these segments were assessed utilising the hand calculation method of the Calculation of Road Traffic Noise (CRTN) for typical properties, rather than by the computerised noise model.
- 12.5 The assessed proposed Isham Bypass runs to the west of Isham, commencing from the existing A509 just south of the A14 in the north and rejoining the A509 south of Hill Top. A plan showing the route of the proposed Bypass is provided in Figure 7. The Bypass was assessed as dual carriageway from its northern start to the proposed roundabout at Hill Top, with single carriageway from this roundabout to the existing A509. The three proposed side roads were also assessed as single carriageway.

### Traffic Data

- 12.6 The future traffic flows utilised in the assessment are presented in Appendix P of the current report and are based on the 'existing' (2002) traffic flows, assuming high growth rate forecasts from that base year. This traffic data includes anticipated impacts from the Office of the Deputy Prime Minister's (ODPM) housing allocation for Milton Keynes and South Midlands determined in 2004 and for the proposed WEAST Development. Traffic data has been provided and assessed for future demands based on both Regional Planning Guidance Growth (RPG) and Regional Spatial Strategy Growth (RSS).

### Rail and Aircraft Noise

- 12.7 The frequency of use of the railway line and the airfield are sufficiently low not to be taken into account in the consideration of changes in the noise environment from any proposed highway improvement.

## METHOD OF ASSESSMENT

- 12.8 The noise assessment for the Isham Bypass was undertaken in accordance with the Transport Analysis Guidance (TAG) web-based version of the GOMMMS approach at Plan Level. The DMRB methodology has also been followed in this assessment and provides the fundamental information for the TAG approach.
- 12.9 In the TAG noise assessment methodology, a comparison is made between the 'without' (Do Minimum [DM]) and the 'with' (Do Something [DS]) scheme situations in the future year, 15 years after opening (ie 2024). The future traffic flows utilised in the current assessment have been predicted in accordance with the TAG methodology<sup>1</sup> by applying high growth rate forecasts to the 'existing' (2002) traffic flows of the study area. The traffic data utilised in the current assessment is presented in Figure 2 and Appendix P.
- 12.10 Assessment of the various scenarios required by the TAG methodology was achieved using Atkins' noise modelling programme NoiseMap 2000 (V2.51) which itself is based on the Department of Transport's 'Calculation of Road Traffic Noise' 1988 (CRTN) methodology, as recommended in DMRB 11.3.7, for the extended network beyond the scope of the existing model predicted noise levels were calculated by the hand calculation methods prescribed in CRTN for typical properties and interpolation used to extend the data to all properties. The predictive algorithms contained in the CRTN methodology have been developed from extensive measurement data, validated out to distances of about 300 metres from trafficked roads. Extrapolation outside the ranges of validity quoted in CRTN can lead to progressive and significant error, but may be undertaken in certain circumstances<sup>2</sup>. The CRTN procedures assume "typical traffic and noise propagation conditions which are consistent with moderately adverse wind velocities and directions"<sup>3</sup>. As such, the CRTN methodology will over-predict noise levels in still air conditions or when the wind is blowing in another direction.
- 12.11 Three-dimensional computer models of the proposed scheme and previously assessed wider study area were generated in order to predict indicative future noise levels and identify changes from the future Do Minimum to the future Do Something situations. The models and CRTN hand calculations included important influential factors relating to traffic data and characteristics of the study area, such as those identified in Table 12.1 below, except that the effects of topography were ignored for the existing hand calculated networks due to a lack of topographical information and that for most of the effected residential properties fronted directly onto the road.
- 12.12 All assessments were completed without any noise mitigation measures in place and with an ordinary asphalt surface on the Bypass in order to assess the base situation.

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<sup>1</sup> The Noise Sub-Objective, TAG Unit 3.3.2, Paragraph 2.2.1, Department for Transport (June 2003).

<sup>2</sup> Adapted from Calculation of Road Traffic Noise, Department of Transport (1988), Page 3, Section 5.

<sup>3</sup> Calculation of Road Traffic Noise, Department of Transport (1988), Page 2, Section 4.

**Table 12.1 Factors used in the Determination of Noise from Roads**

Traffic Data		Study Area Characteristics	
<b>Traffic Flow</b>	<b>(18-hr AAWT)</b>	<b>Road:</b>	<b>Type</b> eg single / dual etc
<b>Heavy Goods Vehicles</b>	<b>(%)</b>		<b>Width and Length</b>
<b>Average Vehicular Speed</b>	<b>(kph)</b>		<b>Surface Type</b>
		<b>Landform:</b>	<b>Gradient</b>
			<b>OS Contours</b>
			<b>Cuttings / embankments</b>
		<b>Receivers:</b>	<b>Acoustic Type -</b> Soft eg grass. Hard eg concrete, tarmac, brick
			<b>Distance Attenuation</b>
			<b>Screening / Angle of View</b>
		<b>Barriers:</b>	<b>Reflections</b> eg building / façade
			<b>Building ridge lines etc.</b>

### Road Segments to be Assessed

- 12.13 According to DMRB (Volume 11, Section 3, Part 7, Chapter 3), following a change in traffic flow, improvements or deterioration in the noise environment may be perceived when the changes are as low as 1dB(A). This is equivalent to an increase in traffic flow of 25% or a decrease of 20%. Accordingly, preliminary screening of the existing network roads was carried out to identify where changes in the order of 1 decibel, and hence a significant change in noise, were expected. Road segments were only included within the noise assessment where the change in traffic from the Do Minimum to the Do Something scenario was predicted to be significant according to these terms. Such screening will still result in a probable worst-case-scenario assessment, since the minimum change in environmental noise that is generally noticed by an individual is about 3 dB(A)<sup>4</sup>.
- 12.14 On this basis none of the road segments within the Isham study area along the A14 or the A6 qualified for analysis. Segments of the existing network that did qualify for assessment are summarised in Appendix Q. All segments of the proposed Bypass route were assessed since the increase in traffic flows from DM to DS will be above the significant level of +25% (ie +100%). The only exception to this is the start of the northern-most segment of Bypass, the alignment of which follows the existing network route of the DM scenario, where the associated change in traffic flow is also significant, but at +44.75% rather than +100%.

<sup>4</sup> Planning Policy Guidance 24: Planning and Noise, Department of the Environment (September 1994), Glossary.

### Properties to be Assessed

- 12.15 All residential dwellings within 300 metres of each significant road segment were included within the TAG noise assessment. This standard cut-off distance is defined at 300 metres partly since the attenuating effects of distance reduce road noise levels to near background noise levels by such a distance (however, the effects of road noise increase can still be experienced over 300m under unfavourable meteorological conditions). In addition under Part II of the Land Compensation Act (1973) the first criteria which householders must meet in order to be able to claim for a grant from the Local Authority to provide noise insulation is that the property must be within 300m of a new road or substantially improved roads and that an increase in noise levels is experienced as a result<sup>5</sup>.
- 12.16 In addition to residential dwellings, public houses were also included within the property counts since people may live in such premises. However, in accordance with the TAG methodology all other properties (eg commercial, schools / colleges, health centres, churches, village halls and pavilions etc) were omitted from the analysis.
- 12.17 Properties located within 300 metres of more than one significant road segment were only counted in the assessment once, being included within the count for the road with the highest noise level.
- 12.18 The impact of the proposals on the noise environment of the new housing development at the north of Wellingborough, south of the A510 Northern Way, was not assessed since the change in traffic along this road segment was not significant (ie RPG Demand +1.03%; RSS Demand -1.74%). The impact on other possible housing development land within the study area has not been included in this assessment.

### The Population Exposed to Noise

- 12.19 TAG requires an estimate of the population exposed to noise levels in defined bands, based on dB(A) interval noise contours of <57, 57-59, 60-64, 65-69, 70-74 and >75 dB(A). This was achieved for each of the various scenarios assessed by using Atkins' noise modelling programme *NoiseMap 2000* (V2.51) and hand CRTN calculations, based on traffic data presented in Appendix P. The number of dwellings in each TAG dB(A) Noise Band was converted to population numbers by assuming an average household size of 2.40.

### The Population Annoyed by Noise

- 12.20 TAG also requires an estimate of the number of people annoyed by noise in the longer term (2024) under the Do Minimum and Do Something scenarios. This is based on the population exposed to different noise levels (in dB(A) interval bands) multiplied by the Annoyance Response Function (expressed as % highly bothered by noise) given in TAG Unit 3.3.2, Table 1. TAG uses the "*estimated population likely to be annoyed by noise in the longer term*" as the sole indicator of noise effects and calculates the net difference in population likely to be annoyed by noise between DS and DM in the fifteenth year after opening (ie 2024).

<sup>5</sup> Pollution Handbook, National Society for Clean Air and Environmental Protection (2002), Page 139, Section 3.15.3.

### **TAG Worksheet**

- 12.21 The total number of residential properties in each dB(A) band, obtained by aggregating the results for each significant road segment, was calculated for both the Do-Minimum and Do-Something scenarios in the longer term (ie 2024). All the calculated values were entered into the TAG Worksheet 3.3.2 to estimate the total population annoyed for each significant road segment using the national average household size of 2.40. These results are given in Appendix A Worksheet of the current report and summarised in the Appraisal Summary Table (Table 20.1).
- 12.22 The differences between the DM and DS 2024 situations give the changes in the number of annoyed people in each noise band. Negative values represent improvements and positive values represent deterioration in noise exposure. The summation of results gives the net long-term noise effect attributable to the proposed scheme.

### **CRITERIA FOR SIGNIFICANCE OF IMPACT**

- 12.23 According to DMRB (Volume 11, Section 3, Part 7, Chapter 3), following a change in traffic flow, improvements or deterioration in the noise environment may be perceived when the changes are as low as 1dB(A). This is equivalent to an increase in traffic flow of 25% or a decrease of 20%. As such, road segments were only included within the TAG noise assessment where the change in traffic from the Do Minimum to the Do Something scenario was predicted to be significant according to these terms. In turn, all residential dwellings within 300 metres of each significant road segment were included within the TAG noise assessment.
- 12.24 There are no British Standard definitions currently available to define the significance of noise level changes. The frequencies in Table 12.2 may assist in giving an understanding of the relevance of various differences.

**Table 12.2: Significance of Impact for Noise**

Noise Level Change dB(A) <sup>6</sup>	Effect Description
1 < 3	<b>Slight effect</b>
3 < 5	<b>Moderate effect</b>
5 < 10	<b>Significant effect</b>
> 10	<b>Substantial effect</b>

## BASELINE CONDITIONS

### Existing Noise Environment

- 12.25 Calculated existing noise levels, as characterised by the 2002 DM traffic data and local characteristics, are presented in Appendix S and discussed by sub-regions within the study area below.
- 12.26 The calculated / modelled existing noise levels for areas closest to the proposed bypass itself were verified by sample background noise measurements completed in November 2004 at representative locations in Isham Village, at outlying properties to the west of Isham and at Hill Top / Hill Top Road. The two types of results showed good correlations for the locations within Isham village itself and at Hill Top (ie those along the A509). However, as discussed below, the two types of results were different for properties to the west of Isham and at Hill Top Road.

#### *Isham Village and Outlying Properties*

- 12.27 Properties within Isham village in closest proximity to the A509 experience existing noise levels between 74.6 and 75.1 dB(A). Noise levels at other properties in Isham depend upon their distance from the A509 and screening from neighbouring properties and range from low 70s dB(A) through the 60s to the high 50s dB(A). Dwellings approximately 2 to 4 properties back from (and therefore screened from) the A509 experience existing noise levels within the lowest TAG noise band of <57 dB(A), as does the outlying property Frisby Lodge, which may potentially be affected in the future by noise from the proposed bypass.

<sup>6</sup> These dB(A) bands are similar to those identified in earlier versions of DMRB, Vol 11, Sect 3, Part 7, Para 8.9 (eg 1994).

- 12.28 CRTN predictive algorithms are validated out to distances of approximately 300 metres from trafficked roads, and although under certain circumstances calculations can be undertaken, this can lead to progressive and significant error<sup>7</sup>. Properties to the west of Isham, such as those in Fairfield Road and Winston Drive together with Dunbelly Farm and Springfield are located over 300m from the principal existing road noise source in the area, the A509 but are included within the noise assessment since they may potentially be affected by noise from the proposed bypass in the future. It was therefore decided to use surveyed noise levels for these areas to represent existing conditions, rather than the modelled results. The surveyed results corresponded well with typical background noise data for similar locations. Both versions of existing noise levels were within the lowest TAG Noise Band of <57 dB(A).

#### *Hill Top and North End Farm*

- 12.29 Existing first floor noise levels at 1 to 6 Hill Top vary from 75.0 dB(A) adjacent to the A509, through low 70s dB(A) to high 60s dB(A) furthest from this road. The five Hillside properties experience noise levels in the low 60s dB(A) and North End Farm < 57 dB(A).
- 12.30 Comparison of the calculated existing noise level<sup>8</sup> with the measured noise level near No.1 Hill Top Road unfortunately did not produce a good correlation. This was potentially a result of the fact that when the distance from a receiver (ie the survey position) to the effective source position is less than 30 metres, as it was, CRTN calculations for low traffic flows can be unreliable<sup>9</sup>. However, it was decided to use the calculated existing noise levels, which were lower than the surveyed level, since this is a more conservative representation for the residents of 1 to 19 Hill Top Road and because the survey had to be completed near the end of the permissible 10:00-17:00 period<sup>10</sup>. Therefore, properties 1 to 19 Hill Top Road along the B574 have been categorised as experiencing existing first floor noise levels in the low 60s dB(A).
- 12.31 Sanders Barn is located to the west of the A509 at Hill Top and under the existing noise environment experiences a first floor noise level of 60.2 dB(A) at its eastern façade. Planning permission was granted in 2002 for the conversion of this derelict building for office use. This, to date has not been implemented. As such, this property is not required to be included within the TAG assessment. It has however been included since should a change of use to residential accommodation take place in the future the potential noise issues must be borne in mind.

<sup>7</sup> Adapted from Calculation of Road Traffic Noise, Department of Transport (1988), Page 3, Section 5.

<sup>8</sup> CRTN calculations of the existing noise levels for properties along Hill Top Road were based on the observed traffic flows (November 2004) for the B574, since no other data was available, and traffic data provided by Atkins Cambridge for the A509 where this road could be seen from a receiver. The data provided by Atkins Cambridge was preferred over the observed flows for the A509 since the former was derived from a longer sample period than was possible during the November 2004 survey and as such is likely to be more accurate.

<sup>9</sup> Calculation of Road Traffic Noise, Department of Transport (1988), Page 19, Section 30.

<sup>10</sup> Calculation of Road Traffic Noise, Department of Transport (1988), Page 31, Section 43.

### *A510 Finedon Road, Wellingborough Road and Ryebury Hill*

- 12.32 Existing noise levels experienced by properties within 300m of the A510 (Finedon Road / Wellingborough Road / Ryebury Hill) are dependant on the distance from the A510 and screening from neighbouring properties. First floor noise levels facing the A510 range from high 60s dB(A) closest to the road, through the 60s and high 50s to below 57 dB(A) furthest from the A510.

### *Finedon: Bell Hill, Stocks Hill, Church Hill and Station Road*

- 12.33 Traffic flows along Bell Hill, Stocks Hill, Church Hill and Station Road are quite low in the existing situation and as such the associated noise levels are also low. Properties closest to this road experience noise levels from the low 60s to high 50s dB(A), falling quickly with distance and screening to <57 dB(A).

### *Finedon Station Road*

- 12.34 Façades closest to Finedon Station Road (ie Station Farm and No.s 32 to 42) fall within the 65-69 TAG dB(A) noise band in the existing scenario with Hillsborough Farm, Mill Cottage, Groomesmill House and Badgers End all experiencing noise levels from Finedon Station Road that are considerably less than 57 dB(A).

## **IMPACTS DURING CONSTRUCTION**

### **Construction Noise**

- 12.35 Construction of the Scheme has the potential to create noise and disturbance to nearby receptors. Possible noise sources include static and mobile plant and equipment and the movement of construction vehicles to and within the site. Potential mitigation measures are outlined in Chapter 19.
- 12.36 Potential noise levels associated with the construction of the proposed Isham Bypass have been estimated using the guidance given in British Standard Code of Practice BS5228: 1997 – “*Noise and Vibration Control on Construction and Open Sites*” and Atkins’ noise modelling programme *SiteNoise 2000* (V2.51), which itself is based on Part 1 of BS5228.
- 12.37 Three-dimensional computer models of the proposed scheme and the wider study area have been generated in order to predict indicative noise levels generated by use of the haul road during various construction phases. The models incorporate information regarding typical noise generated by haul plant, together with characteristics of the study area such as ground type and topography, including any features which may screen the workings (eg contours and structures). In addition, the methodology contained within BS5228 has been used to predict indicative noise levels from the various construction activities operating within the vicinity of nine properties selected to represent the potentially most exposed locales of the study area. The assessments have been run without any noise mitigation measures in place in order to assess a worse-case scenario.
- 12.38 From these models and calculations, potential construction noise levels have been calculated at both ground and first floor elevations for representative properties throughout the study area for haul road noise and for nine most exposed properties for noise potentially generated by the various construction activities.

### **Assessed Typical Construction Plant and Associated Noise Levels**

- 12.39 In the absence of detailed specific information, the equipment, plant and working practices that could potentially be used during the construction phase of the proposed bypass scheme was based on general information provided by Atkins' Construction Services Department.
- 12.40 The identified equipment used in the construction noise calculations are shown in Table 12.3 below, together with the associated reference noise levels taken from BS5228.
- 12.41 It was assumed that the main general earthworks would involve two gangs, each consisting of the following plant, as appropriate:
- **1 no. 360° Excavator**
  - **1 no. CAT 963 Loader**
  - **1 no. D6 Dozer**
  - **3 Dump Trucks**
  - **1 no. self-propelled Vibrating Roller**
- 12.42 Supplementary plant utilised during the earthworks was assumed to include a grader for maintaining haul roads and 5 no. lorries for offsite disposal of excess material, fed by 3 no. dump trucks.
- 12.43 Plant typically involved in the construction of bridges includes cranes, concrete pumps and mixers, vibrators and rollers etc. It was advised that the construction of Isham Bypass would be unlikely to warrant the use of piling. On the advice of Atkins' Civil Engineering Department (Exeter) equipment generally utilised during 'deck pouring' (see Table 12.3 below) was modelled to represent the potentially noisiest bridge building related activity as a worse-case-scenario.

**Table 12.3 Typical Construction Equipment and Associated Noise Levels**

Activity	Construction Equipment		Sound Power Level $L_{WA}$ dB *	Activity Equivalent Continuous Sound Pressure Level $L_{Aeq}$ 10m dB §
	Type	No.		
Excavation cuttings	360° Excavator	1	109.2	81.2
	CAT 963 Loader	1	110.0	82.0
	Lorry Mobile	1	99.0	71.0
	Dump Truck Mobile	3	105.4	77.4
Construction embankments	D6 Dozer	1	118.0	90.0
	360° Excavator	1	109.2	81.2
	Vibratory Roller	1	104.0	76.0
	Lorry Mobile	1	99.0	71.0
	Dump Truck Mobile	3	110.0	82.0
Supplementary Haul	Grader	1	109.3	81.3
	Lorry	5	105.0	77.0
	Dumper	3	105.4	77.4
Road Foundations	Lean Mixer	1	116.0	88.0
	Road Roller	1	121.0	93.0
	Lorries Mobile	2	99.0	71.0
	Lorries HAUL	5 / hr	105.0	77.0
Road Surfacing	Asphalt Spreader	1	110.0	82.0
	Self-Propelled Vibrating Roller	1	105.0	77.0
	Lorries Mobile	2	99.0	71.0
	Lorries HAUL	5 / hr	105.0	77.0

\* The A-weighted sound power level of the item of plant in dB re  $10^{-12}$  watts (the usual reference power).

§ The equivalent continuous sound level of this item of plant when involved in a relevant site activity. The value is the A-weighted  $L_{Aeq}$  at a distance of 10m, in dB re  $20\mu\text{Pa}$  (the usual reference sound pressure level).

**Table 12.3 Typical Construction Equipment and Associated Noise Levels (continued)**

Activity	Construction Equipment		Sound Power Level $L_{WA}$ dB *	Activity Equivalent Continuous Sound Pressure Level $L_{Aeq 10m}$ dB §
	Type	No.		
Bridge Construction – Deck Pour	Truck Mixer – <b>standing</b>	1	100.0	72.0
	Truck Mixer – <b>discharging</b>	1	112.0	84.0
	Lorry Mounted Concrete Pump	1	107.0	79.0
	Compressor	2	105.0	77.0
	Poker Vibrators	4	100.0	79.0
	Power Float	1	100.0	72.0
	Truck Mixer – <b>HAUL</b>	5 / hr	99.0	71.0

\*

The A-weighted sound power level of the item of plant in dB re  $10^{-12}$  watts (the usual reference power).

§

The equivalent continuous sound level of this item of plant when involved in a relevant site activity.

The value is the A-weighted  $L_{Aeq}$  at a distance of 10m, in dB re  $20\mu Pa$  (the usual reference sound pressure level).

## Assessed Typical Construction Activity Scenarios

### Topography

#### *Cuttings*

- 12.44 Construction noise from areas of cutting is likely to be at its worst when it commences, with the works being at existing ground level. Following initial excavation, the sides of the working area will increasingly act as a barrier between the working plant and neighbouring areas and may consequently reduce construction noise levels.
- 12.45 The principal area of cutting in the vicinity of residential neighbourhoods within the Isham study area is to the west of Isham Village itself (ie west of Fairfield Road and Winston Drive and east of Dunbelly / Springfield), with additional areas near Frisby Lodge and Hill Top / Hill Top Road.

#### *Embankments*

- 12.46 Construction of embankments has the potential to generate the highest levels of noise when nearing completion, that is when highest above existing ground level.
- 12.47 Areas of embankment associated with the proposed bypass are located over 300 metres from most residential properties within the Isham study area with the exception of Frisby Lodge and some of the properties at Hill Top / Hill Top Road.

### Assessed Scenarios

- 12.48 Given the above discussion, the assessed scenarios included typical construction plant working and travelling at both existing and future ground levels, where applicable, in order to represent the extremes of the potential working scenarios. The assessed scenarios are summarised in Table 12.4 below for clarity.

**Table 12.4: Assessed Construction Activity Scenarios**

Assessed Ground Level	Assessed Construction Activity Scenario	
Existing Ground Level <u>and</u> Future Ground Level	Earthworks:	- Haul Road Only
		- Haul Road and Cutting / Embankment activities (as appropriate)
Future Ground Level ONLY	Road Foundations:	- Haul Road Only
		- Haul Road and Road Foundation activities
	Road Surfacing:	- Haul Road Only
		- Haul Road and Road Surfacing activities
Bridge Activities:	- Haul Road Only	
	- Haul Road and Bridge activities (eg deck pouring)	

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### **Assessed Activities**

- 12.49 The construction activities assessed as operating within each scenario are identified in Table 12.5 below.
- 12.50 In Table 12.5, plant associated with the Haul Roads has been modelled as moving in a regular manner along the centre line of the alignment of the proposed bypass. Alternatively, plant referred to as 'activity' has been treated as 'mobile' plant which moves around in a restricted area only.

Table 12.5: Assessed Construction Scenario Activities and Locations

Construction Scenario	Construction Activity		Associated Plant		Modelled Location	
			No.	Type	either BP Nodes or Distance from Closest Façade (m)	Chainages (m)
<b>Earthworks Road ONLY</b> <i>Haul</i>	Haul Road	– main route only	1	Grader	58-900-902-904	0 – 4,300
			3	Dumpers		
			5	Lorries		
<b>Earthworks Road AND Activities</b> <i>Haul</i>	Haul Road	– main route	1	Grader	58-900-902-904	0 – 4,300
			3	Dumpers		
			5	Lorries		
		- spur	3	Dumper Trucks	900-901	0 - 350
	Excavation / Cutting Gang Activities	- main route and spur	1	360° Excavator	Nearest Site Boundary: Centre Line: Furthest Site Boundary:	<i>See Table 12.6 below</i> <i>See Table 12.6 below</i> <i>See Table 12.6 below</i>
			1	CAT 963 Loader		
			1	Lorry mobile		
3			Dump Trucks mobile			
<b>Road Foundations Haul Road ONLY</b>	Haul Road	– main route only	5 / hr	Lorries	58-900-902-904	0 – 4,300
<b>Road Foundations Haul Road AND Activities</b>	Haul Road	– main route	5 / hr	Lorries	58-900-902-904	0 – 4,300
		- spur	2 / hr	Lorries	900-901	0 - 350
	Road Foundation Activities	- main route and spur	1	Lean Mixer	Centre Line:	<i>See Table 12.6 below</i>
			1	Road Roller		
			2	Lorries mobile		

Table 12.5: Assessed Construction Scenario Activities and Locations (*Continued*)

Construction Scenario	Construction Activity		Associated Plant		Modelled Location	
			No.	Type	either BP Nodes	Chainages (m)
					or Distance from Closest Façade (m)	
<b>Road Surfacing Haul Road ONLY</b>	Haul Road	– main route only	5 / hr	Lorries	58-900-902-904	0 – 4,300
<b>Road Surfacing Road AND Activities</b>	Haul Road	– main route	5 / hr	Lorries	58-900-902-904	0 – 4,300
		- spur	2 / hr	Lorries	900-901	0 - 350
	Road Surfacing Activities	- main route and spur	1	Asphalt Spreader	Centre Line:	See Table 12.6 below
			1	Self-Propelled Vibrating Roller		
2	Lorries mobile					
<b>Over-bridge Haul Road ONLY</b>	Haul Road	Over-bridge	5 / hr	Truck Mixer – HAUL	Over-bridge Working Area	
<b>Over-Bridge Construction Haul Road AND Deck Pour Activities</b>	Haul Road	Over-bridge	5 / hr	Truck Mixer – HAUL	Over-bridge Working Area	
	Bridge Construction Deck Pour Activities	Over-bridge	1	Truck Mixer – standing	Nearest Site Boundary: See Table 12.6 below Centre Line: See Table 12.6 below Furthest Site Boundary: See Table 12.6 below	
			1	Truck Mixer – discharging		
			1	Lorry Mounted Concrete Pump		
			2	Compressor		
			4	Poker Vibrators		
1	Power Float					

## METHODS OF ASSESSMENT AND COMPARISON

### Methods of Assessment

- 12.51 BS5228 provides the established accepted methodology for predicting construction noise. However, it must be borne in mind that given the many variables involved and the ever changing nature of the construction work, accurately predicting construction noise is inherently difficult.
- 12.52 Noise levels generated by the haul road during the various phases of the construction works were estimated using Atkins' noise modelling programme *SiteNoise 2000* (V2.51), which itself is based on Part 1 of BS5228.
- 12.53 Due to the transient nature of construction activities when in the vicinity of individual properties, separate models would be required for each property and each scenario. Therefore the models have been supplemented by completing individual BS5228 calculations mathematically for nine properties selected to represent the potentially most exposed locales of the study area. BS5228 calculations have, where appropriate, been completed for each construction activity operating at various distances from the closest façade of these properties in order to produce indicative noise levels that represent the ever changing nature of construction work. The approximate distances at which calculations have been undertaken for the nine selected properties are recorded in Table 12.6 below.
- 12.54 All the models and calculation-based assessments have been run without any noise mitigation measures in place in order to assess a worse-case scenario.

### The Existing Noise Environment

- 12.55 Calculated / modelled existing noise levels, as characterised by the 2002 Do Minimum traffic data and local characteristics, are presented in Appendix S.
- 12.56 The calculated / modelled existing noise levels for areas closest to the proposed bypass itself were verified by sample background noise measurements taken in November 2004 at representative locations in Isham Village, at outlying properties to the west of Isham and at Hill Top / Hill Top Road. The two types of results showed good correlations for the locations within Isham village itself and at Hill Top (ie those along the A509). However, surveyed results were used for properties to the west of Isham and along Hill Top Road since they were able to offer an improvement to the previously modelled results<sup>11</sup>.

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<sup>11</sup> Properties to the west of Isham are located > 300m from the principal existing road noise source in the area, the A509, but are included within the noise assessment since they may be affected by noise from the proposed bypass in the future. CRTN calculations become progressively unreliable when >300m. It was therefore more appropriate to use the survey data. Modelled results for properties in the Hill Top WEST area (ie along the B574 Hill Top Road, including Sanders Barn) were modified following the November 2004 survey to include the impacts of the B574. Previously no traffic data was available for the B574 for the Existing 2002 scenario.

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## **Comparisons between the Existing Noise Environment and Indicative Construction Noise**

- 12.57 Comparisons between the modelled / surveyed existing noise environment and the predicted construction noise levels (including background noise) generated by various construction activity scenarios at both existing and future ground levels are presented in Appendix S for use of the haul road only and for the operation of the assessed activities with simultaneous use of the haul road. These comparisons are discussed in detail in the next two sections of the current document respectively.
- 12.58 There are no British Standard definitions currently available to define the significance of noise level changes. However, the terms identified in Table 12.2 above are in general use and may assist in giving an improved understanding of the relevance of various differences.

**Table 12.6: Representative Properties and Approximate Distances of Activities from Closest Façade**

Representative Property		Approximate Distance from Closest Façade (m) ...					
Address	Façade	... to Proposed Isham Bypass			... to Orlingbury Road Over-bridge		
		Nearest Site Boundary	Centre Line	Furthest Site Boundary	Nearest Site Boundary	Centre Line	Furthest Site Boundary
21 Winston Drive	West	29	57	85	342	350	362
Dunbelly Barn	East	147	176	206	275	297	320
Springfield	East	112	140	172	143	170	196
Frisby Lodge	East cutting	102	130	148	Properties are located at such a distance from Orlingbury Road over-bridge that any noise generated from the associated activities and haul road have 'NO impact' on existing noise levels.		
	East embnk	120	154	188			
1 Hill Top	North	64	74	86			
3 Hillside	West	168	179	189			
1 Hill Top Road	North	53	68	86			
	East	99	116	132			
11 Hill Top Road	North	26	39	52			
19 Hill Top Road	North	16	24	34			

## PREDICTED CONSTRUCTION NOISE FROM THE HAUL ROAD

- 12.59 The predicted noise levels generated from use of the haul road alone during the various construction phase scenarios at existing and future ground levels, as generated by the *SiteNoise 2000* models, are presented in Appendix S. This Appendix also shows the noise level changes relative to the Existing (2002 Do Minimum) situation, described according to the terms identified in Table 12.2 above.
- 12.60 The predicted noise levels from the haul road alone and comparisons with existing background noise levels are discussed below for each sub-region of the study area, with a summary of the general impacts given at the end of this Section. In the following discussions reference to predicted noise levels from the haul road alone, or from the haul road and construction activities, includes the existing background noise (ie existing background noise + haul road noise added together logarithmically).

### *Western Isham Village and Outlying Properties*

#### *General Earthworks*

- 12.61 When the main haul road (ie proposed alignment of the Isham Bypass) is being used by plant associated with the general earthworks for access to and from the site only, the generated noise (including background noise) received by properties in western Isham and nearby is estimated to range generally between the mid 40s to low 50 dB(A)s at existing ground levels and between the low 40s to low 50 dB(A)s at future ground levels.
- 12.62 This noise source is predicted to result in 'significant' to 'moderate' deteriorations to the noise environment of properties to the west of Isham closest to the proposed bypass (ie Winston Drive, Fairfield Road, Springfield and Dunbelly) at existing ground level, but only 'slight' deteriorations when at future ground level. These deteriorations will range from 'moderate' through to 'unnoticeable' (ie <1dB(A)) with increasing distance and screening from the haul road (ie Winston Drive, Fairfield Road, Ryehill Close & Frisby Lodge) at existing ground level and from 'slight' to 'unnoticeable' (ie <1dB(A)) at future ground level since the sides of the cutting at this location will act as acoustic barriers.

#### *Road Foundations and Surfacing*

- 12.63 Plant using the proposed alignment of the Isham Bypass as a haul road only during the laying of road foundations and surfaces is predicted to result in only a 'slight' to 'unnoticeable' (ie <1dB(A)) detrimental impact on the existing noise environment of western Isham when utilised at proposed ground levels, depending on the proximity of receivers to the haul road. This noise level is lower than it might have been since the sides of the cutting at this location will again act as acoustic barriers.

*Orlingbury Road Over-bridge*

- 12.64 The alignment of the proposed Isham Bypass will require an over-bridge to be constructed to the south-west of Isham Village in order to maintain the operation of the existing Orlingbury Road.
- 12.65 The haul road and associated haul vehicles modelled for the Orlingbury Road over-bridge working area generated lower noise levels at source than the other modelled haul road scenarios. Therefore, in combination with the attenuation of noise over the distance between the over-bridge and properties in western Isham and limited angles of view, this noise source did not increase the existing background noise of these dwellings at either ground or first floor elevation. The one exception was the closest property, Springfield, however the detrimental impact on this property is only estimated to be 'unnoticeable' (ie <1dB(A)).

*Central and Eastern Isham Village*

- 12.66 Noise generated by a haul road along the alignment of the proposed bypass alone is not predicted to result in any change to the existing background noise levels for properties within central and eastern Isham when utilised at either existing or future ground levels under any of the modelled activity scenarios. This is to be expected given that noise levels generated by vehicles using the haul road are predicted to be low and in addition will be reduced before reaching these properties due to attenuation over distance (ie >300 metres) and given that buildings to the west of Isham will act as acoustic barriers for properties in central and eastern Isham.

*North End Farm, Hill Top, Hillside and Hill Top Road**General Earthworks*

- 12.67 When utilised solely as a haul road by plant associated with the general earthworks, at either existing or future ground levels, the proposed bypass is predicted to result in 'no change' to the existing noise environment for the majority of façades at North End Farm, Hill Top and Hillside, with only a few façades experiencing an 'unnoticeable' (ie <1dB(A)) deterioration of +0.1 dB(A).
- 12.68 Properties along the B574 Hill Top Road are predicted to experience an 'unnoticeable' (ie <1dB(A)) to 'slight' increase in noise if the proposed bypass is used as a haul road alone at either existing or future ground levels, although numerical differences will be less at future levels due to the sides of the cutting acting as an acoustic barrier.
- 12.69 There are two possible reasons for the increase being greater for properties along B574 Hill Top Road than for the other properties near Hill Top. Firstly, the existing noise levels are lower along Hill Top Road due to being located further away from the dominant noise source, the A509. Secondly, the haul road noise is slightly higher than at Hill Top given the closer proximity of the Hill Top Road houses to the proposed bypass main and spur sections.

*Road Foundations and Surfacing*

- 12.70 When the proposed alignment of the Isham Bypass is being used by plant associated with the laying of road foundations and surfacing for access to and from the site only, the proposed bypass is predicted to result in 'no change' to the existing noise environment of North End Farm, Hill Top and Hillside. Under the same scenario properties along the B574 Hill Top Road are predicted to experience an 'unnoticeable' (ie <1dB(A)) increase or 'no change' in noise.

*Orlingbury Road Over-bridge*

- 12.71 Properties at North End Farm, Hill Top, Hillside and Hill Top Road are located at such a distance from the Orlingbury Road over-bridge that any noise generated from the associated haul road and plant has 'no impact' on the existing noise levels of these properties.

**Predicted Construction Noise from the Haul Road - Summary***General Observations*

- 12.72 From the above discussion and by referring to Appendix S, it can be seen that some general observations regarding the comparison of predicted noise levels from the haul road (including existing background noise) with existing background noise levels can be made. For example:
- Deteriorations to the existing noise environment will be less for properties further away from and more sheltered from the working areas and may indeed result in 'no change' to the existing noise levels at all;
  - The modelled results have confirmed the assumption that construction noise from areas of cutting is likely to be at its worst when it commences, with the works being at existing ground level, but decreases as work progresses and the sides of the working area increasingly act as acoustic barriers. However, in the areas of interest haul road noise on embankments has not been shown to increase when highest above existing ground level. This is probably due to the relatively low noise levels and limited increases in elevations involved.

*Construction Noise Impact – General*

- 12.73 The worst deteriorations to the existing noise environment caused by haul road noise are expected to be during the initial general earthworks.

*Construction Noise Impact – Durations*

- 12.74 The predictions of construction noise from haul roads have taken the proportion of the working day that the activity may occur for into account by including '% on-times' in the models. However, when addressing the deteriorations discussed above it must be borne in mind that although noise from the haul road will occur for the duration of the scheme's works throughout site working hours, its intensity will vary according to the nature and volume of site traffic being used at the time.

## **PREDICTED CONSTRUCTION NOISE FROM VARIOUS ACTIVITIES AND THE HAUL ROAD**

- 12.75 Noise levels generated by various construction activities including general earthworks, the laying of road foundations and road surfaces and bridge construction have been predicted by completing individual BS5228 calculations mathematically for nine properties selected to represent the potentially most exposed locales of the study area, the results from which are presented in Appendix S. The machinery included in these assessed scenarios was again based on general information provided by Atkins' Construction Services Department and is summarised in Table 12.3. Appendix S also shows the noise level changes relative to the Existing (2002 Do Minimum) situation, described according to the terms identified in Table 12.2 above.
- 12.76 BS5228 calculations have been completed for the nine representative properties to supplement the models and have, where appropriate, been completed for each construction activity operating at various distances from the closest façades of these properties in order to produce indicative noise levels that represent the ever changing nature of construction work.
- 12.77 The predicted construction noise levels and comparisons with existing background noise levels are discussed below for each of the nine selected properties, with a summary of the general impacts given at the end of this Section. In the following discussions reference to predicted noise levels from the haul road and construction activities includes the existing background noise (ie existing background noise + construction activity and haul noise added together logarithmically).

### *No. 21 Winston Drive*

- 12.78 When the main section and northern spur of the proposed alignment of the Isham Bypass are being used by plant as a haul road and particular construction activities are being undertaken within the vicinity of No.21 Winston Drive, the associated noise (including background noise) received by the western façade of this property is estimated to range between 50.7 and 72.3 dB(A) at ground level and between 52.2 and 74.1 dB(A) at first floor level.
- 12.79 The predicted deterioration to the existing noise environment of this property varies according to the nature of the construction activity taking place, the location of the operations and the elevation of the receiving point (ie between +6.9 and +30.3 dB(A)). The noise levels are predicted to be lower the further the activities are from No.21 Winston Drive and, generally, when located at the base of the future cutting.
- 12.80 However, irrespective of the activity type, location and receiver height, the activities associated with the general earthworks (excavation), road foundations and road surfacing are predicted to cause a 'substantial' deterioration to the existing noise environment. The deck-pour activities at Oringbury Road over-bridge are, however, predicted to generate a 'significant' deterioration to the existing noise environment.
- 12.81 For No. 21 Winston Drive, the greatest deteriorations to the existing noise environment are predicted to be during the initial general earthworks (excavation) due to their close proximity and during installation of road foundations, probably due to the heavy compaction plant utilised during this

phase. The activities predicted to have the least impact on No. 21 Winston Drive are the over-bridge deck pour, followed by road surfacing.

### *Dunbelly Barn*

- 12.82 When the assessed construction activities are being undertaken within the vicinity of Dunbelly Barn, located to the west of Isham, the associated noise (including background noise) received by the eastern façade of this property is estimated to range between the high 40s and high 50 dB(A)s at ground level and between the low 50s and low 60 dB(A)s at first floor level, having increased from the existing background noise level of 43.8 dB(A) by between +5.9 and +17.0 dB(A). The increases in noise levels are predicted to be lower the further the activities are from Dunbelly Barn and, generally, when located at the base of the future cutting.
- 12.83 The greatest deteriorations to the existing noise environment of Dunbelly Barn are predicted to be during the installation of road foundations, followed by activities during the initial earthworks (excavation), both of which may cause 'substantial' deteriorations at both ground and first floor elevations. Dunbelly Barn may also experience 'substantial' increases in noise during deck-pouring for the Orlingbury Road over-bridge at first floor level. The increases in noise from all other assessed construction activities are anticipated to be 'significant', the least intrusive of which being the road surfacing.

### *Springfield*

- 12.84 Springfield is a detached single storey dwelling, also located to the west of Isham. When the assessed construction activities are being undertaken within the vicinity of this property, the associated noise (including background noise) received by the eastern façade is estimated to range between approximately 50 dB(A) and 60 dB(A) at ground level and between the low 50s and low 60 dB(A)s at first floor level, having increased from the existing background noise level of 43.8 dB(A) by between +7.1 and +18.5 dB(A). The increases in noise levels are predicted to be lower the further the activities are from Springfield and, generally, when located at the base of the future cutting.
- 12.85 The greatest deteriorations to the existing noise environment of Springfield are predicted to be during the installation of road foundations followed by during deck-pouring for the Orlingbury Road over-bridge and then the activities during the initial earthworks (excavation), all of which may cause 'substantial' deteriorations at both ground and first floor elevations. The increases in noise from the other assessed construction activities are anticipated to be 'significant', the least intrusive of which again being the road surfacing.

### *Frisby Lodge*

- 12.86 Frisby Lodge is located to the west of the existing junction between the A509 and Finedon Station Road. A site visit in November 2004 revealed the property to be a derelict barn and as such, this property is not required to be included within a TAG assessment. However, this property has been included within the current assessment since should a change of use to residential accommodation be proposed in the future the potential noise issues must be borne in mind.

- 12.87 When the assessed construction activities are being undertaken within the vicinity of Frisby Lodge, the associated noise (including background noise) received by the eastern façade of this property is estimated to range between the mid 50s and mid 60 dB(A)s at ground level and between the high 50s and high 60 dB(A)s at first floor level, having increased from the existing background noise level of approximately 51 dB(A) by between +5.8 and +16.6 dB(A). The increases in noise levels are predicted to be lower the further the activities are from Frisby Lodge.
- 12.88 During the general earthworks phase, Frisby Lodge is likely to receive noise from both excavation and / or construction activities since it is located near to where the proposed bypass changes between being in cutting and being on an embankment. Assessed construction activities on the embankment are estimated to generate noise levels in the low to mid 60s dB(A) depending on distance and elevation of the receiving point; this is a 'substantial' deterioration to the existing noise environment. The assessed excavation activities are, however, estimated to generate noise levels in the high 50s to low 60s dB(A), again depending on the receiver's distance and elevation; this is a 'significant' deterioration to the existing noise environment.
- 12.89 The greatest deteriorations to the existing noise environment of Frisby Lodge are predicted to be during the installation of road foundations, whereas the least intrusive activity is predicted to be the road surfacing. Given the distance between Frisby Lodge and the Orlingbury Road over-bridge the noise generated from the associated activities and haul road has 'no impact' on the existing noise levels of this property.

### *Hill Top Area*

- 12.90 Atkins' Construction Services Department recommended assuming that the general earthworks would involve two gangs. As such, the construction activities in the vicinity of Hill Top were modelled in two different scenarios at both existing and future ground level. In both scenarios one gang was modelled as undertaking excavation activities along the same cuttings. However, the other gang was modelled as completing construction work on the bypass spur embankment (Segment 902-903 east) in one scenario (referred to as 'Hill Top East') and along the main bypass route embankment (Segment 902-904 south) in the other scenario (referred to as 'Hill Top South').
- 12.91 Given that the modelled haul road and excavation (ie cutting) activities were identical in this area it is the scenario with the embankment construction activities closest to a property's façade that results in higher noise levels, and consequently greater differences from existing noise levels. The detailed BS5228 mathematical calculations completed for five representative properties in the Hill Top area were therefore undertaken, where relevant, with construction activities working on the embankment closest to them in order to represent a worst-case-scenario.

### *No. 1 Hill Top*

- 12.92 No.1 Hill Top was assessed under the 'Hill Top East' scenario, that is, with construction activities being located on the bypass spur embankment (Segment 902-903 east) immediately to the north of this property.
- 12.93 Being located so close to the existing busy A509, No.1 Hill Top already experiences relatively high background noise levels of approximately 73.0 dB(A) at ground floor level and 75.0 dB(A) at first floor level. As such, the predicted impacts of construction activity generated noise are lower for this dwelling than for those properties already discussed above (ie No.21 Winston Drive, Dunbelly Barn, Springfield and Frisby Lodge) and in fact are estimated to cause only a 'slight' to 'unnoticeable' (ie <1dB(A)) deterioration to the existing noise environment. The increases in noise levels are predicted to decrease the further the activities are from No.1 Hill Top.
- 12.94 Again the greatest deteriorations to the existing noise environment of this property are predicted to be during the installation of road foundations, whereas the least intrusive activity is predicted to be the road surfacing. The assessed activities associated with the Orlingbury Road over-bridge are believed to have 'no impact' on the existing noise levels of this property given the distances between the two.

### *No. 3 Hillside*

- 12.95 No.3 Hillside is located in a terrace of properties to the east of the existing A509 near Hill Top and, like Frisby Lodge, is situated in the vicinity of where the proposed bypass changes from being situated in cutting to being on an embankment. Calculations for this property have therefore been completed under the 'Hill Top South' scenario where excavation and construction activities are located on the main bypass route (Segment 902-904 south).
- 12.96 During the general earthworks phase, the assessed excavation (ie cutting) activities are estimated to generate noise levels in the low 60 dB(A)s, depending on the distance and elevation of the receiving point. This is only an 'unnoticeable' (ie <1dB(A)) deterioration from the existing noise environment, which itself is already influenced by the existing A509. The assessed construction (ie embankment) activities are, however, estimated to generate noise levels in the low to mid 60 dB(A)s, again depending on the receiver's distance and elevation, which is a 'slight' deterioration to the existing noise environment.
- 12.97 Road surfacing activities in the vicinity of No.3 Hillside are expected to only increase the existing noise environment by an 'unnoticeable' (ie <1dB(A)) level, and given the distance between this property and the Orlingbury Road over-bridge the assessed associated activities are expected to have 'no impact' on No.3 Hillside. The most intrusive activity for this property is again expected to be the laying of road foundations which may increase existing noise levels by a 'moderate' amount.
- 12.98 The increases in noise levels generated by the various construction scenarios are predicted to decrease the further the activities are from No.3 Hillside.

### *No. 1 Hill Top Road*

- 12.99 Given the proximity of No.1 Hill Top Road to both the southern section of the main proposed bypass route (ie Segment 902-904) and its western spur (ie Segment 902-905), BS5228 calculations have been completed for both the northern and eastern façades of this property.
- 12.100 When the assessed construction activities are being undertaken within the vicinity of the northern façade of No.1 Hill Top Road the associated noise (including background noise) is estimated to range between the low and high 60 dB(A)s at ground level and between the mid 60s and low 70 dB(A)s at first floor level, having increased from the existing background noise level of low 60 dB(A)s by between +2.3 and +11.5 dB(A).
- 12.101 For the eastern façade of No.1 Hill Top Road, the assessed construction activities are estimated to generate associated noise levels (including background noise) between the high 50s and mid 60 dB(A)s at ground level and between the low to mid 60 dB(A)s at first floor level, having increased from the existing background noise level of high 50 dB(A)s by between +1.1 and +7.2 dB(A).
- 12.102 The northern façade is estimated to receive higher construction noise levels than the eastern façade of No.1 Hill Top Road, given its closer proximity to the works.
- 12.103 The following statements are true for both the northern and eastern façades of No.1 Hill Top Road:
- the increases in noise levels are predicted to be lower the further the activities are from the façade and, generally, when located at the base of the future cutting;
  - the most intrusive activity is expected to be the laying of road foundations which may increase existing noise levels 'significantly' or 'substantially';
  - road surfacing activities are expected to be the least intrusive of the assessed activities, but may still increase the existing noise environment by 'slight' to 'moderate' levels;
  - given the distance between these façades and Orlingbury Road over-bridge the associated assessed activities are expected to have 'no impact'.

### *No. 11 Hill Top Road*

- 12.104 No.11 Hill Top Road is located towards the centre of the row of primarily semi-detached dwellings on the south-side of the existing B574 near Hill Top. The northern façade of this property is estimated to receive higher construction noise levels than the equivalent façade of No.1 Hill Top Road, given its closer proximity to the works.
- 12.105 When the assessed construction activities are being undertaken within the vicinity of the northern façade of No.11 Hill Top Road the associated noise (including background noise) is estimated to range between the high 60s and high 70 dB(A)s at ground level and between the high 60s and low 80 dB(A)s at first floor level, having increased from the existing background noise level by between 'significant' and 'substantial' amounts (ie between +8.4 and +20.3

dB(A)). The increases in noise levels are predicted to be lower the further the activities are from No.11 Hill Top Road and, generally, when located at the base of the future cutting.

- 12.106 The most intrusive activity for No.11 Hill Top Road is anticipated to be the laying of road foundations, which may increase existing noise levels 'substantially' during the duration of this activity. Road surfacing activities are expected to be the least intrusive of the assessed activities, but may still increase the existing noise environment by 'significant' levels. Given the distance between No.11 Hill Top Road and the Orlingbury Road over-bridge, the assessed associated activities are again not expected to have any impact on this property.

### *No. 19 Hill Top Road*

- 12.107 No.19 Hill Top Road is situated at the western end of the row of properties along the B574 near Hill Top. The northern façade is located even closer to the proposed construction works than both No.11 and No.1 Hill Top Road and as such is estimated to receive higher construction noise levels than the equivalent façades of both these properties.
- 12.108 For the northern façade of No.19 Hill Top Road, the assessed construction activities are estimated to generate associated noise levels (including background noise) between the low 70s and mid 80 dB(A)s at ground level and between the mid 70s and mid 80 dB(A)s at first floor level, having increased from the existing background noise level by between +13.0 and +26.0 dB(A). The increases in noise levels are predicted to be lower the further the activities are from No.19 Hill Top Road.
- 12.109 However, irrespective of the activity type, location and receiver height, the activities associated with the general earthworks (excavation), road foundations and road surfacing are predicted to cause a 'substantial' deterioration to the existing noise environment. The deck-pour activities at the Orlingbury Road over-bridge are, however, not predicted to have any effect on the existing noise environment of No.19 Hill Top Road given the distance between the two.

## **Predicted Construction Noise from Various Activities and the Haul Road - Summary**

### *General Observations*

- 12.110 From the above discussion and by referring to Appendix S, it can be seen that some general observations regarding the comparison of predicted noise levels from the assessed activities and simultaneous use of the haul road (including existing background noise) with existing background noise levels can be made. For example:
- Deteriorations to the existing noise environment will be less for properties further away from and more sheltered from the working areas and may indeed result in 'no change' to the existing noise levels at all;
  - The calculated results have confirmed the assumption that construction noise from areas of cutting is likely to be at its worst when it commences, with the works being at existing ground level, but decreases as work progresses and

the sides of the working area increasingly act as acoustic barriers. However, in the areas of interest, construction related noise from embankments has not been shown to increase when highest above existing ground level. This is probably due to the limited increases in elevations within the vicinity of the assessed properties;

- Haul roads may generate an increased noise level when compared to existing noise levels, but it is the haul road combined with construction activities that are predicted to generate higher increases.

### *Construction Noise Impact - General*

- 12.111 The potential impact of construction noise on the nine selected properties is influenced by their existing background noise environment. For example, No. 21 Winston Drive, Dunbelly Barn and Springfield in particular, and also Frisby Lodge, have low background noise levels and consequently the effects of construction noise can be considerable in comparison with these levels. In contrast, given their proximity to the existing A509 and B574 the representative properties in the Hill Top area have higher background noise levels and as such the impact of construction works may be less noticeable, although this does depend on the proximity of the property to the activities.
- 12.112 The calculations indicate that the construction activity with the greatest or least impact on the existing noise environment of a particular property varied for each of the nine selected properties, according to its proximity to and screening from the works.
- 12.113 However, in general, the worst deteriorations to the existing noise environment are expected to be during the installation of road foundations and the initial general earthworks. For the former activity, this is probably a result of the heavy compaction plant utilised during this phase and for the latter it is probably due to the nature of the plant used, in combination with the fact that it is operating at existing ground levels.
- 12.114 For the nine selected properties, road surfacing activities are expected to generate less noise than both general earthwork activities and road foundation activities when in comparable locations at future ground levels. However, road surfacing is still predicted to cause temporary 'substantial' and 'significant' deteriorations to existing background noise levels at six of the selected properties (ie No.21 Winston Drive and No.19 Hill Top Road and Dunbelly Barn, Springfield, Frisby Lodge and No.11 Hill Top Road respectively).
- 12.115 The 'deck pouring' activities at Orlingbury Road over-bridge may result in 'substantial' or 'significant' increases when compared to existing background noise levels for properties closest to the works (ie Springfield, Dunbelly Barn and No.21 Winston Drive). However, the increase in noise reduces quickly with distance and shielding from the works and for the remaining six selected properties the assessed bridge construction activity is predicted to have 'no impact' on background noise levels.

### *Construction Noise Impact - Durations*

- 12.116 As in the *SiteNoise 2000* (V2.51) models, the individual BS5228 calculations have taken the proportion of the working day that each activity may occur for

into account by including ‘% on-times’. However, when addressing the deteriorations discussed above it must be borne in mind that each activity will have varying durations.

- 12.117 For example, noise from the haul road will occur for the duration of the scheme’s works, although its intensity will vary according to the nature of the works being undertaken at the time. In contrast, noise levels from general earthworks will only occur in each sub-region of the study area for a medium length period of time (eg 8 – 10 weeks) and noise levels from laying road foundations and surfaces will only occur in each sub-region for a short period of time. Deck-pouring operations, however, commonly have to be undertaken over an intense period of time, for example over approximately 24 hours. Such a short timescale will be preferable for neighbouring residents, however the fact that the operation may also occur at night is obviously a disadvantage, although potentially unavoidable.

### **SUMMARY AND RECOMMENDATIONS – CONSTRUCTION NOISE**

- 12.118 BS5228 provides the established accepted methodology for predicting construction noise. However, it must be borne in mind that given the many variables involved and the ever changing nature of the construction work, accurately predicting construction noise is inherently difficult.
- 12.119 In the absence of detailed specific information, the equipment, plant and working practices that could potentially be used during the construction phase of the proposed Isham Bypass was based on general information provided by Atkins’ Construction Services Department.
- 12.120 Use of the haul road has been modelled along the centre line of the alignment of the proposed bypass at different elevations, where appropriate, in order to represent the extremes of the potential working scenarios. Indicative noise levels from each construction activity have, where appropriate, been calculated for operating at various distances from the nine representative properties, again at appropriate ground levels, in order to represent the ever changing nature of construction work. The models and calculations were completed without any noise mitigation measures in place in order to assess a worse-case scenario.
- 12.121 Due to the primarily rural nature of the affected area in the immediate vicinity of the proposed Isham Bypass, the existing background noise levels are generally low and consequently the effects of construction noise may be considerable.
- 12.122 The worst deteriorations to the existing noise environment are expected to be during the initial general earthworks and installation of road foundations, particularly to the west of Winston Drive, Isham and in the vicinity of No.19 Hill Top Road due to the close proximity of these properties to the proposed works and their currently low background noise levels.
- 12.123 The impact of the haul road and the initial general earthworks on the noise environment near the west of No.21 Winston Drive could be mitigated in part by constructing a temporary bund along the bypass boundary to the rear of Winston Drive prior to the haul road becoming operational. Such a measure could reduce the anticipated noise levels by 5 dB(A).
- 12.124 Given the proposed topography and layout of the area near No.19 Hill Top Road it is unlikely that a temporary bund would be practical at this location. It

is therefore recommended that instead consideration is given to restricting working hours to be considerate to the local residents, for example not permitting early starts or working late in the evening. In addition, consideration could be given to restricting access to the slip road to when it is actually being prepared and constructed only (ie no general access permitted).

- 12.125 As stated above, the effects of construction noise may be considerable for affected areas within the vicinity of the proposed Isham Bypass. However, careful selection of plant to as far as possible be the best available and to favour new and quiet plant (eg fitted with silencers) together with careful consideration of working practices and operational hours will serve to minimise construction noise as far as practicable.

### IMPACTS WHEN OPERATIONAL

- 12.126 Comparison of Existing versus Future scenarios (DM and DS) would include the effects of 'natural' traffic growth over time. Therefore, in order to assess the changes in noise level that are directly attributable to the proposed scheme itself, the DM and DS scenarios should be compared in the same year (ie 2024). The results of such an assessment are discussed below, firstly by sub-region within the study area and secondly in overall terms.

#### TAG Assessment: Sub-regions of the Previous Study Area

- 12.127 The previously investigated study area included the following roads, with assessments being undertaken only for properties within 300m of segments experiencing significant changes in traffic flows between the future DM and DS Scenarios:

- **A509 Kettering Road / Wellingborough Road / Kettering Road**  
(from its junction with the A14 in the north to its junction with the A510 in the south);
- **Burton Latimer Station Road;**
- **B574 Hill Top Road;**
- **B574 Orlingbury Road;**
- **A5193 Harrowden Road;**
- **A14**  
between the A509 and A6 Roundabouts;
- **A6** between A6 Roundabout and A510  
Ryebury Hill / Thrapston Road (Finedon);
- **Proposed Isham Bypass;**
- **A509 Niort Way;**
- **A510 Northen Way;**
- **A510 Stewarts Road;**
- **A510 Rixon Road;**
- **A510 Finedon Road / Wellingborough Road / Ryebury Hill;**
- **Bell Hill / Stocks Hill / Church Hill / Station Road;**
- **Finedon Station Road.**

- 12.128 Table 12.7 below summarises the change in noise levels from the DM2024 to the DS2024 scenarios for sub-regions of the previously assessed study area within 300m of significant roads, in terms of the number of properties within each of the TAG Noise Bands. In this table, 'No Change' implies that a property remains in the same TAG noise band in both of the future scenarios (ie DM2024 and DS2024). As such, the actual noise level received by a property may have changed within that noise band, but it has not changed sufficiently enough to warrant a change in TAG noise category assignment.

**Table 12.7 Change in TAG Noise Bands from DM2024 to DS2024 for Sub-divided Regions of the Previously Assessed Study Area**

RPG Demand			
Location	No. Residential Properties		
	Improvement	NO CHANGE	Deterioration
Isham Village and Outlying Properties	95	167	22
Hill Top	13	8	17
Great Harrowden	12	18	12
Finedon Station Rd	3	9	0
<b>TOTAL *</b>	123	202	51
RSS Demand			
Location	No. Residential Properties		
	Improvement	NO CHANGE	Deterioration
Isham Village and Outlying Properties	65	189	30
Hill Top	14	13	11
Great Harrowden	4	23	15
Finedon Station Rd	0	0	0
<b>TOTAL *</b>	83	225	56

\* The total number of houses assessed is 12 more under the RPG Demand Scenario than under the RSS Scenario since Finedon Station Road experiences a significant change in traffic flow under the former scenario (ie -24.29%) and properties within 300m of this road are therefore included within the RPG assessment, but they are not included in the RSS assessment since the change is not significant (ie -15.61%).

- 12.129 In addition to the information provided in Table 12.7, predicted noise levels for the Do Minimum and the Do Something scenarios for the Design Year (2024), as generated by the *NoiseMap 2000* models<sup>12</sup> for areas within 300m of significant segments of the proposed Bypass and previously assessed existing network, are presented in Appendix Q. This Appendix also shows the potential effect of the proposed scheme itself, described according to the terms identified in Table 12.2 above.

<sup>12</sup> DoMin2024 modelled results were amended for some properties west of Isham located >300m from the A509, following the November 2004 survey, but still remained within the < 57dB(A) TAG Band.

- 12.130 There are no British Standard definitions currently available to define the significance of noise level changes. However, the terms identified in Table 12.2 above are in general use and may assist in giving an improved understanding of the relevance of various differences.

### Impact of the Scheme on Sub-Regions of the Previous Study Area

#### *Properties on Isham Road to Pytchley*

- 12.131 The two properties on Isham Road (ie Sunny Hill and neighbour), just south of the A14 Roundabout junction with the A509, north of Isham are located within approximately 150 metres of the A509. This road is anticipated to experience a significant increase in traffic flows from the DM2024 to the DS2024 Scenario of +44.75% under the RPG Demand and of +60.99% under the RSS Demand. This increase in total traffic and Heavy Goods Vehicles (HGV) is anticipated to result in a deterioration in the local noise environment, although less so for the northern façades of these properties for which the A14, which experiences a none significant improvement in traffic flows (-7.70% RPG and -3.12% RSS), is likely to be the dominant noise source.

#### *Isham Village and Outlying Properties*

- 12.132 The traffic flow along the A509 within Isham is significantly reduced in DS2024 compared to the equivalent DM situation under both the RPG and the RSS Demand Scenarios (ie by -49.09% to -65.78% and -40.27% to -57.27% respectively) due to the proposed Bypass attracting traffic away from the village centre. Such a reduction in the volume of traffic is estimated to result in a 'slightly' to 'moderately' improved noise environment along and in the immediate vicinity of the A509 under both the RPG and the RSS Demand Scenarios. The extent of improvement varies in accordance with distance from and angle of view of the A509 and the floor level and façade of the properties concerned.
- 12.133 Noise levels in both the DM and DS 2024 situations improve with increasing distance and screening from the A509. However, whereas DM2024 noise levels typically range from the mid 70s dB(A) through the 60s to the high 50s dB(A) in both Demand Scenarios, the DS2024 levels are generally only in the low 70s, 60s and high 50s dB(A). Dwellings a few properties back from (and therefore screened from) the A509 experience noise levels within the lowest TAG noise band of <57 dB(A) in both DM2024 and 2024 under both demand scenarios.
- 12.134 In terms of TAG noise bands, under the RPG Demand Scenario properties within Isham village closest to and with the least obstructed views of the A509 generally experience a reduction of one band (eg from >75 to 70-74 dB(A), 70-74 to 65-69dB(A) or 65-69 to 60-64dB(A)), but may remain in the same band (eg 65-69dB(A) or 60-64dB(A)). Beyond this properties may experience a one band improvement to be re-assigned into either the 57-59 or the <57 dB(A) TAG bands, or the reduction in noise may not be sufficiently significant with the property therefore remaining within the same TAG band of one of the lowest three bands.
- 12.135 The comments made in the previous paragraph also generally apply to the RSS Demand Scenario, although in this case the reduction in noise is more likely to not be sufficiently significant to change the TAG band allocations and as such more properties therefore remain within the same noise band.

12.136 The exceptions to the above general comments regarding the noise implications for Isham are those façades that in the DM2024 situation are predicted to experience noise levels below 57dB(A), but will be newly exposed to the direct effect of traffic noise from the proposed bypass. These properties are located to the west of Isham and include the western ends of Fairfield Road and Winston Drive and the outlying properties Dunbelly Farm, Springfield and Frisby Lodge. These properties are predicted to experience 'significant' or 'substantial' deteriorations to their noise environment in the DS2024 scenario under both the RPG and the RSS Demand Scenarios. However, noise levels should not be greater than 64dB(A) at first floor level. The impact of the proposed bypass in this area is reduced from its potential maximum impact due to the fact that where it runs closest to the properties identified above it is located in a cutting.

#### *Hill Top and North End Farm*

12.137 Introduction of the proposed Bypass will attract vehicles away from and effectively close some segments of the A509 in the vicinity of Hill Top. As a result, under both the RPG and the RSS Demand Scenarios, properties to the east of the existing A509, including North End Farm, will experience an improvement in noise that ranges from 'substantial' closest to the old A509 to 'unnoticeable' (ie <1dB(A)) furthest away.

12.138 Under the RPG Demand Scenario DM2024 first floor noise levels at the northern façades of No.s 1 to 6 Hill Top are expected to vary from the mid 70s dB(A) adjacent to the A509, through the low 70s dB(A) to the high 60s dB(A) furthest from this road. With higher traffic flows under the RSS Demand Scenario, equivalent DM2024 noise levels are expected to be in the mid to low 70s dB(A) only. However, in both Demand Scenarios these properties are expected to experience levels in the low 60s dB(A) in the DS2024 scenario.

12.139 Similarly, whereas the five Hillside properties are predicted to experience noise levels in the mid 60s dB(A) in the DM2024 scenario under both Demand Scenarios, this is likely to be reduced to the low 60s dB(A) if the bypass is built. The noise level at North End Farm will improve 'very slightly' (ie by <1dB(A)) to 'slightly' under both RPG and RSS Demands, and will remain within the <57 dB(A) TAG noise band.

12.140 Although traffic flows along the existing B574 will primarily be moved slightly further north of No.s 1 to 19 Hill Top Road onto the proposed side road, the increased volumes of traffic in the area are anticipated to result in a deterioration to the noise environment under the RPG Demand Scenario. This deterioration is predicted to be 'slight' for the eastern-most properties of this row of houses, 'unnoticeable' (ie <1dB(A)) for the next properties which are less affected by the main segment of the bypass, and then increasingly worse again as the spur gets closer to the properties as it merges in with the existing alignment of the B574, reaching a 'significant' deterioration at No.19 Hill Top Road. Under the RSS Demand Scenario the eastern-most properties of the row of houses are predicted to experience an 'unnoticeable' (ie <1dB(A)) deterioration; the next properties a 'slight' improvement due to the traffic being moved further away; and then an increasing deterioration westwards again through to a 'significant' deterioration again at No.19 Hill Top Road.

- 12.141 In terms of TAG Noise Bands, under the RPG Demand, No.s 1,2 and 9 to 19 are expected to be re-classified from the 57-59 to the 60-64 dB(A) band and No.s 3 to 8 to remain within the 57-59dB(A) noise band. Under the RSS Demand, No.s 1 to 12 are expected to remain within the 60-64dB(A) noise band and No.s 13 to 19 to be re-classified from the 60-64 to the 65-69 dB(A) band.
- 12.142 The façades of No.s 1-19 Hill Top Road with substantial views of the main bypass (ie eastern and southern façades) will experience a 'moderate' deterioration in noise under the RPG Demand and a 'slight' to 'moderate' deterioration under the RSS Demand as a result of the proposed bypass bringing increased volumes of traffic and numbers of HGVs closer to the dwellings in this area. Under the RPG Demand this deterioration is not expected to raise noise levels above 58dB(A) for such façades of the western-most properties along the B574 at Hill Top , but may increase the noise to the high 50s and low 60s closer to the Bypass itself. Under the RSS Demand this deterioration is expected to raise noise levels to the high 50s for such façades of the very western-most properties through to the low 60s closer to the main bypass.
- 12.143 Sanders Barn is located to the west of the A509 at Hill Top and, as mentioned above, although planning permission was granted for the conversion of this derelict building for office use in 2002, to date this permission has not been implemented. Should a change to residential use ever be considered it must be recognised that the predicted DM2024 first floor noise level on the eastern façade of this property could rise 'significantly' from 60.2 to 67.2 dB(A) under RPG traffic flows and from 60.9 to 67.4 dB(A) in the RSS scenario.
- 12.144 As with Western Isham, the impact of the proposed bypass is reduced from its potential maximum impact on properties at Hill Top and Hill Top Road due to the fact that where it runs closest to these properties it is located in a cutting.

#### *Great Harrowden*

- 12.145 Changes to the noise environment of properties at Great Harrowden will be due to the re-distribution of traffic as previous journey-routes become more or less attractive with the Isham Bypass in operation and / or as a result of ramifications of the WEAST and MKSM developments, rather than as a result of any physical change to the road network. Traffic data indicates that flows along the A509 may increase between the DM2024 and DS2024 scenarios to both the north and south of Great Harrowden, although only by a significant percentage in the RPG Demand Scenario between Hill Top and Great Harrowden. The B574 Orlingbury Road is, however, expected to experience a significant decrease in total traffic flow in both the RPG and RSS Demand Scenarios by -92.34% and -29.43% respectively.

- 12.146 As a result of these changes in traffic flow, properties to the east of the A509 are predicted to experience an increase in noise of one TAG Noise Band or to remain within the same band under both the RPG and RSS Demand Scenarios. Thus noise levels for properties closest to the A509 on its eastern side are expected to range from the low 70s to high 60sdB(A) in the DM2024 situation, but from the mid 70s to the high 60sdB(A) in the DS2024 situation under both demand scenarios. Further back from the A509 properties on its eastern side are anticipated to experience noise levels in the mid 60s to mid 50s in the DM2024 situation, but from the mid 60s to the high 50sdB(A) in the DS2024 situation under both demand scenarios.
- 12.147 Properties closest to the A509 on its western side may experience a very slight deterioration to their noise environment, but are expected to remain within either the 70-74 or 65-69 dB(A) TAG noise bands under both demand scenarios.
- 12.148 The improvement to the noise environment of properties along the B574 Orlingbury Road is less marked under the RSS Demand Scenario than the RPG Demand (eg 'slight' rather than 'significant'). Consequently 15 residential properties in the RSS Scenario remain within the same TAG Noise Band in both DM2024 and DS2024, with 4 improving by one band; whereas in the RPG scenario 12 properties improve by one to two noise bands and 7 remain within the same band.

#### *Finedon Station Road*

- 12.149 The change in traffic along Finedon Station Road from the DM2024 to the DS2024 situation is only significant under the RPG Demand Scenario (ie -24.29%), not the RSS Scenario (-15.61%), and as such residential properties within 300m of this road are only included within the RPG assessment.
- 12.150 Under the RPG Demand Scenario, façades closest to Finedon Station Road (ie of Isebrook Cottage, Station Farm and No.s 32 to 42) fall within the 70-74 TAG dB(A) noise band in the DM2024 scenario, but improve by an 'unnoticeable' (ie <1dB(A)) to 'slight' amount under the DS2024 situation to either remain within the 70-74 dB(A) TAG band or to be re-categorised into the 65-69 dB(A) band. 'Unnoticeable' (ie <1dB(A)) to 'slight' improvements also occur for the façades of the more distant properties facing Finedon Station Road (ie of Mill Cottage, Groomesmill House, Badgers End and Hillsborough Farm), although the noise levels are expected to be within the <57 dB(A) TAG noise band under both the DM2024 and DS2024 scenarios.

#### **TAG Assessment: Sub-regions of the Additional Study Area**

- 12.151 In the current assessment it was requested that existing segments of the A43 between Northampton and Kettering and associated roads were also analysed. These additional segments were assessed utilising the Calculation of Road Traffic Noise (CRTN) hand method, rather than by noise modelling as they had not previously been required to be assessed and therefore had not been included within the existing computer models.
- 12.152 The results of such an assessment are discussed below, firstly by sub-region within the study area and secondly in overall terms.

- 12.153 It should be noted that changes to the noise environment of properties within 300m of significant segments of the additional existing network will be due to the re-distribution of traffic as previous journey-routes become more or less attractive with the Isham Bypass in operation and / or as a result of ramifications of the WEAST and MKSM developments, rather than as a result of any physical change to the road network (eg re-alignment or removal of existing roads or addition of new roads in the immediate vicinity).

#### *Broughton*

- 12.154 Under both the RPG and RSS Demand Scenarios, residential properties in Broughton closest to Kettering Road and the High Street are anticipated to experience noise levels generally within the 70-74 and 65-69 dB(A) TAG noise bands in DM2024. Such noise levels are expected to quickly decrease to the 60-64 and 57-59dB(A) noise bands with increased distance from and increased screening from this road by neighbouring structures. Dwellings furthest from and most screened from this road may experience noise levels of < 57dB(A) in DM2024 under both demand scenarios.
- 12.155 In DS2024, traffic flows through the centre of Broughton are expected to have decreased significantly from DM2024 under both the RPG and RSS Demand Scenarios (ie by -85.23% and -77.31% respectively). Such a decrease in traffic may result in an associated decrease in noise of approximately 8 dB(A) in the RPG situation and 7 dB(A) under RSS. As such, residential properties in Broughton are anticipated to experience an improved noise environment and in DS2024 to be classified in the two lowest TAG Noise Bands in the RPG situation and the lowest four bands in the RSS situation, depending on distance and screening from Kettering Road / High Street.

#### *Overstone and Sywell*

- 12.156 The majority of properties in the villages of Overstone and Sywell front directly onto the road variously known as The Avenue, Sywell Road, Overstone Road and Wellingborough Road. Under the RSS Demand Scenario, properties closest to this road are anticipated to experience noise levels generally within the 65-69, 60-64 and 57-59 dB(A) TAG noise bands in DM2024. Such noise levels are expected to quickly decrease to the <57 dB(A) noise band with increased distance from and increased screening from this road by neighbouring structures.
- 12.157 The Avenue, Sywell Road, Overstone Road and Wellingborough Road only experience a significant change in flow under the RSS Demand Scenario. This significant change is predicted to be a decrease in traffic flows of -63.99%, which may result in an improvement in noise of around 4dB(A). With this noise reduction, the majority of properties in Overstone and Sywell are predicted to fall within the <57 dB(A) band in DS2024. Properties along The Avenue between the A43 and Billing Lane will also improve (in fact by one or two bands), but will fall within the 60-64 or 57-59dB(A) bands in DS2024 and properties around Highfield Lodge, Wellingborough Road will either improve by one Noise Band to fall within the 57-59 or <57dB(A) bands in DS2024 or remain within the same band as in DM2024 (eg 65-69 or <57dB(A)).

### Little Harrowden

- 12.158 The road running in a NE-SW direction through Little Harrowden is known as Hardwick Road in the south-west and Main Street (B574) in the north-east. Hardwick Road is expected to experience a significant change in traffic flow under the RSS Demand Scenario (ie -63.99%), but not under the RPG Demand (+14.06%). Main Street, however, is expected to experience a significant increase in traffic flow under both demand scenarios (+187.73 in RPG and +209.81% under RSS), probably as a result of vehicles wishing to join the proposed Bypass at Hill Top.
- 12.159 As a result of these changes in traffic, under the RPG Demand Scenario properties within Little Harrowden are anticipated to experience noise levels in the 70-74dB(A) noise band through to <57dB(A) band with increasing distance and screening from Hardwick Road and Main Street in DS2024, rather than only from the 60-64 to <57dB(A) bands in DM2024.
- 12.160 Under the RSS Demand Scenario properties closest to Main Street may experience an increase in noise, but those along Hardwick Road a decrease.

### TAG Assessment: Total Study Area

- 12.161 Results from comparing the future DM and DS scenarios in terms of the estimated net number of people annoyed by significant changes in traffic noise in the study area as a whole are presented in Appendix A and summarised in Table 12.8 below. Results are presented for both the RPG and RSS Demand Scenarios, for significant areas of the previously assessed study area, then the additional existing network and finally for both combined.
- 12.162 Table 12.8 shows that the proposed Bypass will result in an overall net improvement to the noise environment by offering relief from noise annoyance to an estimated 40 people in the 'significant' Isham study area (previously assessed and additional) under the RPG Demand Scenario and to an estimated 63 residents in the RSS Scenario. This improvement is primarily a result of the proposed scheme diverting vehicles away from roads within more built-up areas to those passing through more rural environments.

**Table 12.8 Summary of TAG Noise Assessment**

Assessed Scenario		Total Estimated Population Annoyed		Net Population that Win <sup>-ve</sup> / Loose <sup>+ve</sup>
Traffic Demand	Significant Segments of Road Network	Do Minimum	Do Something	
<b>RPG 2024</b>	Isham Bypass and Previously Assessed Existing Network	140	122	- 18
	Additional Existing Network ONLY	237	215	-22
	Bypass and Previously Assessed & Additional Existing Networks	377	337	<b>- 40</b>
<b>RSS 2024</b>	Isham Bypass and Previously Assessed Existing Network	140	131	- 9
	Additional Existing Network ONLY	483	429	- 54
	Bypass and Previously Assessed & Additional Existing Networks	623	560	<b>- 63</b>

- 12.163 When comparing the results for the proposed Bypass and significant segments of the previously assessed Existing Network in Table 12.8 above, it can be seen that the overall net effect of the Bypass is predicted to be more beneficial under the RPG Demand Scenario (ie for 18 people) than under the RSS Demand Scenario (ie for only 9 people). This is to be expected since the RSS Traffic data is considerably greater than the RPG.
- 12.164 From Table 12.8, this would appear not to be true for the assessed significant areas around the Additional Existing Network (ie RPG less beneficial than RSS). However, due to the TAG assessment methodology's suggestion to assess significant areas only<sup>13</sup>, the overall results in Table 12.8 mask the truth, since 667 more houses are included in the RSS assessment than the RPG. This is because the road variously named The Avenue, Sywell Road, Overstone Road, Wellingborough Road, Moonshine Gap and Hardwick Road which runs in a north-easterly direction from the A43 east of Moulton to Little Harrowden is significant in the RSS scenario (-63.99%), but not in the RPG scenario (+14.06%).
- 12.165 Estimated results from the RSS Scenario for the same significant areas around the Additional Existing Network as assessed under the RPG Scenario (ie without the extra 667 houses) are presented in Table 12.9 below.

**Table 12.9 Summary of TAG Noise Assessment for RPG Equivalent RSS Results for the Additional Existing Network**

Assessed Scenario		Total Estimated Population Annoyed		Net Population that Win <sup>-ve</sup> / Loose <sup>+ve</sup>
Traffic Demand	Significant Segments of Road Network	Do Minimum	Do Something	
<b>RSS 2024</b>	Additional Existing Network ONLY	300	288	- 12
	Bypass and Previously Assessed & Additional Existing Networks	440	419	- 21

- 12.166 If Table 12.9 is compared with the equivalent RPG results in Table 12.8 it can be seen that the overall net effect of the Bypass is now predicted to be more beneficial under the RPG Demand Scenario (ie for 40 people) than under the RSS Demand Scenario (ie for only 21 people). This is what was expected since the RSS Traffic data is considerably greater than the RPG.
- 12.167 On the previously assessed Existing Network, Finedon Station Road is significant under the RPG scenario (-24.29%), but not under the RSS (-15.61%), therefore the dwellings within 300m of this road are included in the RPG assessment, but not in the RSS assessment. However, the expected overall net result of the Bypass being more beneficial under the RPG Demand Scenario than the RSS Scenario is not masked by the differing house counts since the difference in the number of houses was only 12.

<sup>13</sup> The Noise Sub-Objective, TAG Unit 3.3.2, Paragraph 1.1.5, Department for Transport (June 2003).

### Noise Insulation Regulations

- 12.168 A further assessment has been undertaken to identify whether any of the properties within the study area qualify for sound insulation under the Noise Insulation Regulations (1998) by meeting all of the following criteria<sup>14</sup>:-
- The property must be within 300 metres of a new road or substantially improved road;
  - The combined expected maximum noise level, ie the noise level from the new or altered highway (ie Bypass) together with other traffic in the vicinity (ie on significant segments of the existing network), must not be less than the specified noise level of 68 dB(A) L<sub>10</sub> (18-hour) (NB 67.5 dB(A) and above is rounded up to 68 dB(A));
  - The new noise level with the altered highway must be at least 1 dB(A) more than the noise level existing before the works to construct or improve the highway commenced;
  - The new or altered highway must add at least 1 dB(A) to the increase in the total noise level generated by existing roads and the new / amended highway.
- 12.169 The Regulations apply to eligible habitable rooms and therefore preclude bathrooms, toilets, halls and usually kitchens. Properties affected by increased traffic along existing roads resulting from re-routing or traffic management schemes, or from a general increase in traffic flow are not eligible for sound insulation.

### Applying Noise Insulation Regulations to the Previously Studied Network

- 12.170 The process of identifying any properties in the previously considered study area potentially qualifying under the Noise Insulation Regulations (1998) due to the proposed Isham Bypass is shown in the final columns of the tables presented in Appendix Q. These tables reveal that although some properties will still experience noise levels in excess of 67.5 dB(A) in DS2024 throughout the previously considered study area under both the RPG and RSS Demand Scenarios, these properties already experienced high noise levels in the comparable DM2024 scenario, and in fact constructing the proposed Bypass is expected to offer an 'unnoticeable' (ie <1dB(A)) to 'moderate' improvement for these properties.

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<sup>14</sup> Adapted from CRTN, Department of Transport (1988), Page 3, Section 6 and Page 59, Annex 1.

- 12.171 Two exceptions to this generalisation are No.12 Kettering Road and No.6 Orlingbury Road in Great Harrowden, which experience noise levels in excess of 67.5 dB(A) in the DS2024, but which are estimated to experience a 'slight' and unnoticeable' (ie <1dB(A)) deterioration (rather than improvement) in noise respectively. No.12 Kettering Road is predicted to experience first floor noise levels in excess of 67.5dB(A) in the DS2024 Scenario, ie 71.9 dB(A) under RPG and 72.2dB(A) under RSS, which is an increase of +2.5dB(A) and +2.2dB(A) respectively. However, this property would not qualify under the Noise Insulation Regulations (1998) since it is situated over 300m away from the proposed Isham Bypass and since properties affected by increased traffic along existing roads are not eligible for sound insulation. No.6 Orlingbury Road would also not qualify since it is both >300m from the proposed bypass and since the increase in noise is <1dB(A) anyway (ie +0.4dB(A) in RPG and RSS).
- 12.172 By applying the Noise Insulation Regulations (1998) requirements to the previously considered study area there is only one location that might potentially fall within these provisions. This location concerns the western-most properties of the row of houses along the B574 at Hill Top (eg potentially west of No. 12), but under the RSS Demand scenario only. For example, Appendix Q shows that No.19 Hill Top Road is predicted to experience a first floor noise level of 63.2 dB(A) at its northern façade in the DM2024 RSS Scenario which is estimated to increase by +5.0dB(A) to 68.2 dB(A) in the DS2024 RSS Scenario. With this increase of over 1 decibel due to the new highway (primarily Segment 902-905) and a potential future noise level exceeding the minimum specified noise level of 67.5dB(A), this property and its immediate neighbours (ie approximately No.s 18 – 13) could qualify for sound insulation. However, further detailed calculations for this area would be recommended before any insulation being awarded.
- 12.173 Another property that should at least be considered is Sanders Barn, located to the west of the A509 / proposed Bypass and south of the B574 Hill Top Road. Under the DM2024 scenario the eastern façade of this property is predicted to experience first floor noise levels of 60.2 dB(A) under RPG and 60.9dB(A) under RSS; under the DS Scenario (2024) these levels are expected to be 67.2 dB(A) and 67.4 dB(A), a 'significant' increase of approximately +7.0 and +6.5 dB(A) respectively. With these increases of over 1 decibel due to the new highway (primarily Segment 902-904) and a potential future noise levels very close to the minimum specified noise level of 67.5dB(A), this property could qualify for sound insulation. However, a site visit in November 2004 revealed the property to be a derelict barn. As such, this property is not required to be included within the TAG assessment and consequently does not qualify for sound insulation. However, as stated above this property has been included within the current assessment since should a change of use to residential accommodation be proposed in the future the potential noise issues must be borne in mind.

### **Applying Noise Insulation Regulations to the Additional Existing Network**

- 12.174 Properties assessed in significant areas around the Additional Existing Network (ie along the A43 between Northampton and Kettering and associated roads), will not qualify under the Noise Insulation Regulations (1998) since they are located over 300m away from the proposed Isham Bypass and since properties affected by increased traffic along existing roads are not eligible for sound insulation.

### Assessment of Specified Properties

- 12.175 In previous assessments of the proposed Northern Isham Bypass Options and the preferred Route (Route 2) the Client identified three properties for which a separate discussion regarding the Noise Insulation Regulations (1998) was required. The results of this assessment for the proposed Design Year of 2024 are summarised in Table 12.10 below.
- 12.176 The expected noise levels summarised in Table 12.10 indicate that at No.23 Winston Drive the noise level is expected to increase by more than 1 decibel due to the new highway. However, the 18 hour  $L_{10}$  index does not exceed the specified noise level of 68 dB(A) in the future (ie DS2024 is 63.5 dB(A) under RPG and 63.8dB(A) under RSS). Consequently No.23 Winston Drive does not qualify for sound insulation under the Noise Insulation Regulations (1998).
- 12.177 No.4 Ormond Place is actually located over 300 metres from the proposed Bypass, therefore any increase in noise due to the Bypass itself is likely to be attenuated over distance and to consequently not have a significant impact on No.4 Ormond Place. The existing A509 is likely to be the dominant noise source for this property, and the significant decrease in traffic flow from the DM2024 to the DS2024 on this road in both the RPG and RSS Demand Scenarios is likely to be the principal reason for this property experiencing a 'slight' improvement to its noise environment. Being located over 300m from the Bypass and experiencing an improvement in noise, rather than a deterioration, means that this property also will not qualify for sound insulation.
- 12.178 Traffic on the main section of the new highway and the spur(s) will provide additional noise sources close to No.1 Hill Top Road, although the potentially detrimental impact of the proposed bypass at this location is reduced since it is sited in a cutting. Noise levels for No.1 Hill Top Road are expected to increase by more than 1 decibel in both the RPG and RSS Scenarios. However, the 18 hour  $L_{10}$  index is below the specified noise level of 68 dB(A) in the future (ie DS2024 = 61.0dB(A) RPG and 61.5dB(A) RSS) and as such this property does not qualify for sound insulation under the Noise Insulation Regulations (1998) either.

**Table 12.10: Noise Assessment at Selected Properties in 2024**

Noise Sensitive Property		Assessed Demand Scenario	Estimated Noise Level (LA <sub>10,18hr</sub> 2024)		Difference (DS – DM)	Comment
Address	Façade		Do Minimum	Do Something		
23 Winston Drive, Isham	<b>Rear</b> (facing west)	RPG:	<b>47.3</b>	<b>63.5</b>	<b>+ 16.2</b>	<b>Cutting. No noise barrier.</b>
		RSS:	<b>47.6</b>	<b>63.8</b>	<b>+ 16.2</b>	<b>Does not qualify as &lt;67.5dB(A).</b>
4 Ormond Place, Isham	<b>Side</b> (facing west)	RPG:	<b>58.9</b>	<b>56.8</b>	<b>- 2.1</b>	<b>Partial Cutting. No noise barrier.</b>
		RSS:	<b>59.7</b>	<b>58.0</b>	<b>- 1.7</b>	<b>Does not qualify as &lt;67.5dB(A) &amp; &gt;300m.</b>
1 Hill Top Road, Hill Top	<b>Side</b> (facing east)	RPG:	<b>57.2</b>	<b>61.0</b>	<b>+ 3.8</b>	<b>Mostly shallow cutting. No noise barrier.</b>
		RSS:	<b>58.7</b>	<b>61.5</b>	<b>+ 2.8</b>	<b>Does not qualify as &lt;67.5dB(A).</b>

## MITIGATION MEASURES WHEN OPERATIONAL

- 12.179 The assessment of the Isham study area in relation to the Noise Insulation Regulations (1998) requirements only identified the western-most properties at Hill Top, along the B574, and Sanders Barn (currently a derelict barn) as potential properties of concern. Therefore noise mitigation measures would be hard to justify.

## SUMMARY

- 12.180 The TAG noise assessment has only been completed for road segments within the Isham study area where the change in traffic between the future (2024) Do Minimum and Do Something scenarios is significant (ie >+25% or >-20%).
- 12.181 The impact of the proposed Isham Bypass on noise can be assessed as beneficial in comparison with the equivalent Do Minimum scenario in the Design Year (2024), offering relief from noise annoyance to an estimated 40 people (net) in the 'significant' Isham study area (previously assessed and additional) under the RPG Demand Scenario and to an estimated 63 people (net) in the RSS Scenario. The adverse effects of the proposed scheme have been minimised by the decision to locate the proposed bypass route in cutting where it passes closest to existing properties at Isham and Hill Top.
- 12.182 The only properties identified as potentially qualifying for sound insulation under the *Noise Insulation Regulations* (1998) are the western-most properties at Hill Top, along the B574, under the RSS Demand Scenario. In addition, it is recommended that the currently derelict Sanders Barn, located to the west of the A509 and proposed Bypass, south of Hill Top Road, is borne in mind since predicted increases of over 1 decibel due to the new highway and potential future noise levels very close to the minimum specified noise level of 67.5dB(A) in both the RPG and RSS Scenarios mean that this property could qualify for sound insulation should a change of use to residential accommodation be proposed in the future. No other properties were identified during the noise assessment as fulfilling the criteria for sound insulation under the Noise Insulation Regulations (1998), including the three properties specified by the Client.
- 12.183 The conclusions of the assessment of the proposed Bypass are presented in the Appraisal Summary Table (see Table 20.1).

## 13. AIR QUALITY

### INTRODUCTION

- 13.1 This chapter details the air quality assessment for the Isham Bypass. The generalised assessment of local air quality was carried out using the guidance and methods specified in Transport Analysis Guidance (TAG Unit 3.2) Appraisal, February 2004 and TAG 3.3.3 The Local Air Quality Sub-objective, April 2004.
- 13.2 TAG 3.3.3 provides guidance on assessing the impact of transport options on local air quality. This takes account of the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland, The Air Quality Regulations and the European Union Limit Values.
- 13.3 The approach to assessing local air quality was based on the plan level method, defined in TAG Unit 3.3.3. This approach was possible because there were spatially detailed transport model traffic flow data available. It involved a qualification of the change in air pollution exposure at properties in the opening year 2009.
- 13.4 Regional Air Pollution was assessed following the guidance given in TAG Unit 3.3.4 (Feb 2004) and the impact on Greenhouse Gases was assessed according to the advice given in TAG Unit 3.3.5 (Feb 2004), Greenhouse Gases Sub-objective.

### METHOD OF ASSESSMENT

#### Local Air Quality Assessment

- 13.5 The assessment method was based on the methods described in the Design Manual for Roads and Bridges (DMRB). At the plan level the local air quality appraisal uses the detailed transport model flows, the percentage of heavy vehicles, traffic speed, road gradient and the type of road.
- 13.6 According to TAG Unit 3.3.3, due to the uncertainty in traffic forecasting and the size of traffic flow change needed to affect air quality, options which change traffic flows by less than 10% on the existing or new routes, or elsewhere on the local network were scoped out.
- 13.7 Pollutant concentrations for 2009 for the links affected (where the change in traffic flow is greater than 10%), for both the do-minimum and do-something scenarios were calculated. The calculation of pollutant concentrations was carried out using DMRB 11.3.1 air quality screening method. This involves entering the following data into an Excel spreadsheet prepared by the Highways Agency:

- ◆ Annual Average Daily Traffic Flow Rate No. vehicles (Combined)/day
- ◆ Percentage of Heavy Goods Vehicles %
- ◆ Annual Average Traffic Speed Km/Hour
- ◆ Road Segment Length Km
- ◆ Road Type [A] All Motorways and A Roads  
[B] Urban Roads not [A]  
[C] All other roads

- 13.8 The next step was to quantify the exposure to this change based on the property count. However the properties were banded according to distance, to take account of the diminishing effects of pollution over distance. The bands were:
- ◆ 0 to 50m
  - ◆ 50 – 100m
  - ◆ 100 – 150m
  - ◆ 150 – 200m
- 13.9 Beyond 200m the contribution of vehicle emissions from the road centre to local pollution levels is not significant.
- 13.10 The measure of exposure is the product of the number of houses in the band and the average pollution concentration in the band. The overall exposure for the road link is the sum of the exposures over all bands for the Do something minus the sum of the exposures across all bands for the Do Minimum. The overall exposure for the whole Scheme is the sum of the exposures on each link. This assessment produces values that define the magnitude of exposure due to the addition, or removal, of pollution from a specific number of properties. The method takes account of all significant changes in exposure, whether on existing or new routes, or elsewhere on the local network. An overall negative value indicates a reduction of exposure and therefore a general improvement in air quality. An overall positive value indicates an increase in exposure and therefore a general deterioration in air quality. A qualitative comment provides an indicator of whether any air quality strategy objective was exceeded or whether an exceedence was removed.
- 13.11 In this assessment the TAG Local Air Quality (LAQ) worksheets have been completed. They are included in Appendix A.
- 13.12 An assessment of the annual mean concentrations of NO<sub>2</sub> and PM<sub>10</sub> within each of these bands for all affected links was made using the method described in DMRB 11.3.1. As required by the TAG methodology concentrations were determined at 20, 70, 115 and 175m from each road to correspond to the average concentrations within each band. This assessment was carried out for the opening year 2009 for both the Do-Minimum and Do-Something scenarios.
- 13.13 The TAG LAQ worksheet multiplies the number of properties by the average band concentration, adds these products for each distance band and then subtracts the do-minimum value from the do-something value. A positive value indicates an increase in exposure and a negative value indicates a reduction of exposure or an improvement. The exposure values for each link were then added to find the overall exposure for the whole scheme. The number of properties with improvement, no change and with deterioration were also summarised for inclusion in the Appraisal Summary Table.
- 13.14 Air Quality Strategy objective comments were noted in support of this assessment. These included if either of the following situations applied:
- ◆ The proposal leads to an increase in annual mean PM<sub>10</sub> levels at 20m from the road centre of at least 1µg/m<sup>3</sup>,

- ◆ The proposal leads to an increase in annual mean NO<sub>2</sub> levels at 20m from the road centre of at least 2µg/m<sup>3</sup> and where concentrations are above the AQS NO<sub>2</sub> objective of 40µg/m<sup>3</sup>.

### Regional Impact Assessment

- 13.15 The contribution made by traffic to regional scale air pollution depends on the total amount of pollution emitted. TAG Unit 3.3.4 - Regional Air Pollution, recommends the use of NO<sub>x</sub> as the best indicator of potential for regional air pollution impacts.
- 13.16 TAG Unit 3.3.5 - The Greenhouse Gases Sub-Objective, advises that CO<sub>2</sub> is considered to be the most important greenhouse gas and therefore recommends that it should be used as an indicator for the purposes of assessing the effects on climate change.

### Assumptions

- 13.17 The existing (2002) 24 hour traffic flows on the affected routes, the corresponding future (2009) 24 hour Do Minimum traffic flows and the traffic flows on the affected roads associated with the proposed bypass are listed in Appendix P together with the corresponding percentage heavy goods vehicles, typical speeds and road types. Both the Regional Planning Guidance Growth (RPG) and Regional Spatial Strategy Growth (RSS) scenarios have been considered.
- 13.18 Road segments which met the greater than 10% change in traffic flow criterion are shown in Table 13.1.

**Table 13.1 Roads with sufficient change in traffic flow to cause a significant, local air quality impact**

Road Name	Links
A509	58-18 18-16 16-03 3-15 15-12 12-904
B574 Hill Top Road	12-14
A510 Wellingborough Road	76-702 702-701 701-75
Station Road	18-04
Finedon Station Road	75-110 110-71 71-15

Road Name	Links
Isham Bypass	900-901 900-902 902-905 902-903 902-904
A510 link in Wellingborough	77-98 98-76

### CRITERIA FOR SIGNIFICANCE OF IMPACT

13.19 The aim is to quantify the change in exposure at properties in the opening year as a result of the scheme. The method will take into account all significant changes in exposure (which is greater than 10%), whether on existing or new routes, or elsewhere on the local network. A negative value will indicate that there is reduced exposure and therefore a general improvement in air quality. A positive value will indicate an increase in exposure and therefore a general detrimental effect upon air quality.

### BASELINE CONDITIONS

13.20 The Borough Council of Wellingborough and Kettering Borough Council have completed reviews and assessments of local air quality in their areas of jurisdiction. However these concluded that nitrogen dioxide and small particles were below the maximum concentrations set by the United Kingdom Air Quality Objectives and that these concentrations were expected to fall further over the next few years as technology and fuels improve and that as such it was not necessary to declare any Air Quality Management Areas.

### IMPACT DURING CONSTRUCTION

- 13.21 Air quality can be affected by dust raising activities during construction and by emissions from additional construction vehicles, both on site and travelling to and from the site.
- 13.22 Dust emissions can lead to increased deposition rates in the surrounding area which can cause soiling of cars, windows, washing etc. and so would be a nuisance. Dust emissions can also lead to increased concentrations in the air, both for total particulate loading and for the smaller fraction, PM10.
- 13.23 These types of impact do not generally extend more than 100m from a construction site. Until further information is available from the selected contractor regarding the proposed methods of construction and types of plant to be used, it is not possible to assess the likely impacts in more detail. Potential mitigation measures are outlined in Chapter 19.

## IMPACTS WHEN OPERATIONAL

### Local Air Quality Assessment

- 13.24 The overall assessment scores and numbers of properties which would experience an improvement and deterioration in air quality in relation to the future Do-Minimum are listed in Table 13.2.
- 13.25 The associated worksheets leading to these results are reproduced in Appendix A.

**Table 13.2 Summary of Overall Assessment Scores for the proposed bypass**

	RPG		RSS	
	PM <sub>10</sub>	NO <sub>2</sub>	PM <sub>10</sub>	NO <sub>2</sub>
<b>Overall Assessment Score</b>	-53	-166	-29	-47
<b>Number of properties with improvement</b>	692	692	358	358
<b>Number properties with no change</b>	0	0	334	334
<b>Number properties with deterioration</b>	107	107	107	107

(negative = improvement)

- 13.26 These overall assessment scores show clearly that the proposed bypass will result in a significant overall improvement in local air quality. As summarised in Table 13.2, there will be 692 dwellings with improved air quality and 107 with worsened air quality for the RPG traffic growth estimates. There will be the same number of dwellings with worsened air quality for the RSS traffic estimates but less with improved air quality. This is because 334 dwellings will have no significant change in air quality.
- 13.27 Table 13.3 suggests that the impacts on air quality are greater with the RSS traffic estimates. 4 more properties are expected to have more than 1 µg/m<sup>3</sup> increase in PM<sub>10</sub> and 26 more properties will have increases of more than 2 µg/m<sup>3</sup> of NO<sub>2</sub>. No properties are expected to have NO<sub>2</sub> concentrations above the Air Quality Standard of 40µg/m<sup>3</sup> for either traffic growth estimate.

**Table 13.3: Number of properties with significant increases in air pollution**

	Number of properties for	
	Isham Bypass	
	RPG	RSS
PM <sub>10</sub> increases > 1 µg/m <sup>3</sup>	3	7
NO <sub>2</sub> increases of > 2 µg/m <sup>3</sup>	7	33
NO <sub>2</sub> concentration > 40 µg/m <sup>3</sup>	0	0

### Regional Impact and Greenhouse Gases Assessment

13.28 The calculated carbon dioxide emissions (which are a measure of the effects on greenhouse gases) and the oxides of nitrogen emissions (which are an indicator of regional air pollution impacts) for the existing situation (2002), the 2009 DM and 2009 DS scenarios are summarised in Table 13.4 and 13.5 for the RPG and RSS traffic estimates.

**Table 13.4: Summary of Expected Carbon Dioxide and Oxides of Nitrogen Emissions (tonnes/year) (RPG)**

Impact		2002	2009	
		Existing	Do Minimum	Isham Bypass
<b>Greenhouse</b>	CO <sub>2</sub> (Tonnes/yr)	10624	12568	16405
<b>gases</b>	% of DM	84.5	100	130.5
<b>Regional</b>	NO <sub>x</sub> (tonnes/yr)	68238	39216	55506
<b>air quality</b>	% of DM	174.0	100	141.5

**Table 13.5: Summary of Expected Carbon Dioxide and Oxides of Nitrogen Emissions (tonnes/year) (RSS)**

Impact		2002	2009	
		Existing	Do Minimum	Isham Bypass
<b>Greenhouse</b>	CO <sub>2</sub> (Tonnes/yr)	10624	9156	14451
<b>gases</b>	% of DM	116.0	100	157.8
<b>Regional</b>	NO <sub>x</sub> (tonnes/yr)	68238	21852	48951
<b>air quality</b>	% of DM	312.3	100	224.0

13.29 These results indicate that the bypass would increase the emissions of greenhouse gases between 30 and 58% depending on which traffic growth estimates were more correct. Similarly the regional air pollution would increase by between 30 and 124% from the opening year Do-minimum situation. The lower emissions are associated with the RPG traffic estimates.

### MITIGATION MEASURES WHEN OPERATIONAL

13.30 Air quality, even within 20m of the kerbside is very much better than the air quality objectives set out in the Air Quality Limit Value Regulations 2001 and therefore air quality mitigation measures are not considered to be necessary.

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## SUMMARY

- 13.31 The impact on local air quality of the new road and the associated re-distribution of traffic on the existing road network is beneficial in terms of the Overall Assessment Score. The proposed bypass has high negative assessment scores (significant improvement). Up to 692 properties will have improved air quality and 107 will have a deterioration air quality with the RPG traffic estimates. No properties would have air quality worst than the limits set out in the Air Quality Limit Value Regulations 2001. Therefore the impact on local air quality can be assessed as beneficial in comparison to the Do Nothing scenario.
- 13.32 There could be an increase in of greenhouse gases of up to 58% and an increase in total emissions of up to 124% over the Do Minimum situation.
- 13.33 The results of this air quality assessment are summarised in Table 20.1, in an Appraisal Summary Table format.

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## 14. WATER ENVIRONMENT

### INTRODUCTION

- 14.1 New roads can have an impact on the hydrology and quality of surface waters or groundwater, both during the construction phase and once the road is operational.
- 14.2 Water quality is potentially affected by pollutants from runoff and spray including heavy metals (such as zinc and copper), suspended solids, chloride ions, organics and hydrocarbons. These are derived from road surface and vehicle wear, exhaust emissions, oil, de-icing salts and rubbish. Contamination can affect surface waters and also groundwater, potentially causing longer-term problems. This could impact on existing uses of the water for amenity, water abstraction and habitats.
- 14.3 The hydrology of receiving watercourses can be affected by the presence of a new impermeable surface. A new road may increase the volume of runoff that reaches the receiving watercourse and also reduce the time it takes to get there. This has implications for channel stability, aquatic habitats and flooding. Where the movement of any existing channels is required, this may also affect the local hydrological regime.
- 14.4 New development in the floodplain can have implications for flooding both of the new development itself and elsewhere. The effect of the bypass on the drainage channels and floodplain is addressed in a separate Flood Risk Assessment, which is included in Appendix M.
- 14.5 This chapter of the Environmental Statement describes the existing nature of the water environment in the vicinity of Isham, outlines the potential impacts of the proposed road and highlights the mitigation measures required.

### METHOD OF ASSESSMENT

- 14.6 The existing nature of the water environment has been identified through correspondence and consultation with the Environment Agency, as well as monitoring on site.
- 14.7 TAG sets out the framework in which to assess the attributes of the water environment and their importance, along with the potential impacts of a new road and their magnitude and significance. This involves identifying relevant features and their attributes. For Isham the attributes include water supply, transport and dilution of wastewater, biodiversity, aesthetics, recreation, value to economy and conveyancing of flow, material and flood waters.
- 14.8 The potential impacts on water quality were assessed using the established methodology for routine runoff and spillage risk outlined in the Design Manual for Roads and Bridges Volume 11 Section 3 Part 10 (DMRB 11.3.10). The methodology for routine runoff considers the impact of zinc and copper. The spillage risk assessment calculates the return period of a serious accident based on road length, presence of junctions, annual average daily traffic (AADT), percentage of heavy goods vehicles (%HGV), serious spillage rates, emergency services response time and River Ecosystem (RE) Target of the receiving watercourse.

## CRITERIA FOR SIGNIFICANCE OF IMPACT

- 14.9 The attributes of the water environment are evaluated on the basis of quality, scale, rarity and substitutability, giving an overall importance. The operational effect of the new road is assessed using criteria for determining impact magnitude, for example 'loss of attribute'. The significance of the impact is estimated by considering both the importance of attributes in the water environment and the predicted impact magnitude.

**Table 14.1: Significance of Impact for the Water Environment**

<b>Significance of Impact/Appraisal Category</b>	<b>Examples</b>
Very Significant Adverse	Loss of internationally important habitat, pollution of major aquifer
Highly Significant Adverse	Reduction in GQA grade of receiving waters; pollution of local potable water source; increase in flood risk
Significant adverse	Reduction in economic value, reduced productivity of fishery
Low Significance Adverse	Measurable but limited beneficial changes in attributes
Insignificant	Discharges to watercourse but no significant loss in quality, biodiversity, aesthetics or economic value and no increase in flood risk
Low Significance Beneficial	Measurable but limited beneficial changes in attributes
Significant Beneficial	Increase in economic value, increase in fishery productivity
Highly Significant Beneficial	Improvement in GQA grade of receiving waters, mitigation of pollution of local potable water source, decrease in flood risk
Very Significant Beneficial	Mitigation of pollution of major aquifer or of internationally important habitat

- 14.10 Specific criteria were used for assessing the magnitude and significance of the operational impacts of the road on water quality, and whether mitigation measures are required. These are the surface water quality tests, and the spillage risk return period. The impact is deemed serious and requiring mitigation if the tests for zinc and copper are failed or if the spillage risk return period is less than 1 in 50 years. All of these tests consider the effects of the road in the context of the existing environment (current use of water and estimated RE Target).
- 14.11 For both the water quality test and the spillage risk assessment an RE target of 1 was assumed as the receiving watercourse is currently unclassified. This approach is precautionary.

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## BASELINE CONDITIONS

14.12 The area around the proposed route of the Isham bypass is undulating and is drained by a number of small streams that flow into the southward flowing River Ise. Between the A14 to the north and Wellingborough to the south, the River Ise receives four major tributaries from the west. From north to south these are: Pytchley Brook, Hardwick Brook, an un-named watercourse located south of the village of Little Harrowden and Harrowden Brook. To the east of the river are several un-named water courses. The most northerly of these flows around the south side of Burton Latimer, another significant tributary flows from the village of Finedon, and another along the A510 from the south of Finedon to Wellingborough. There are also various drains on both sides of the River Ise that drain the flatter areas of the floodplain.

## Flood Risk Assessment (FRA)

14.13 Information supplied by the Environment Agency shows that the route of the proposed bypass does not cross Indicative Floodplain. However, the route traverses Pytchley, Hardwick and Little Harrowden Brooks. Flood risk issues are discussed in the completed Flood Risk Assessment, which is included as Appendix M. The FRA refers to

- ◆ Culvert sizing where the new road crosses watercourses;
- ◆ Confirmation that any proposals are consistent with EA's Culverting Policy;
- ◆ Confirmation that drainage design discharge from each outfall does not exceed 5 litres per second per hectare;
- ◆ High level proposals for the use of vegetative systems or SUDS (Sustainable Drainage Systems), to complement traditional hard engineering solutions;
- ◆ Proposed maintenance procedures for culverts and balancing ponds.

14.14 The FRA concluded that:

- ◆ The Scheme is not expected to increase the risk of local flooding;
- ◆ The risk of the road itself flooding is very low; and
- ◆ The proposed culverts will have little impacts on flows.

## Water Resources

14.15 Flow on the River Ise is monitored by the Environment Agency at Harrowden gauging station (NGR 489900, 271500). The Q95 flow (the flow exceeded for 95% of the time) at this point is 0.192 cumecs.

14.16 The Environment Agency has records of six abstraction licences in the vicinity of Isham, as detailed in Table 14.2.

**Table 14.2: Abstractions in the vicinity of Isham**

Purpose	Location	Type of abstraction
Agriculture	Well at Fern Bank	Groundwater source
Agriculture	Well at Westfield Lodge	Groundwater source
Commercial services: Food and drink	Spring at Burton Latimer	Surface water source
Agriculture	River Ise at Finedon	Surface water source
Agriculture	Great Harrowden Brook	Surface water source
Commercial services: Golf Course	Un-named riparian drain, Harrowden; Harrowden Brook – Great Harrowden	Surface water source

14.17 Two are from groundwater for general agriculture, farming and domestic purposes. The other four are from surface waters. The first of these is from a spring at Burton Latimer to supply a food and drink manufacturer. The second is from the River Ise west of Finedon for general agriculture and direct spray irrigation. The third is from Little Harrowden Brook which runs from south of Little Harrowden to the River Ise. This abstraction is for general agriculture and storage for spray irrigation. The fourth and final surface water abstraction is also from the Little Harrowden Brook and an associated ditch to supply a golf course.

14.18 The area does not lie within a groundwater Source Protection Zone but does overlie a mixture of non-aquifer and minor aquifer of high to intermediate vulnerability.

### Water Quality

14.19 The River Ise and Harrowden Brook are monitored by the Environment Agency for water quality (Table 14.3). In the north of the area a 1.5 km stretch of the River Ise is monitored between the confluences with Slade Brook and Pytchley Brook (NGR 488300, 276300 to 488700, 274800). This stretch is sampled at the Burton Latimer road bridge (NGR 488856, 274786). The stretch failed marginally against its RE Target of 2 in 1996 due to high biological oxygen demand and in 1998 due to low dissolved oxygen concentrations. The most recent RE Target (2002) of 2 which was met.

14.20 The most relevant stretch of the Ise in relation to the proposed bypass is a 10 km stretch of the River Ise monitored between the confluences of Pytchley Brook and the River Nene (NGR 488700, 274800 to 490800, 267100). This stretch is sampled at the B571 road bridge (NGR 490721, 267430). The most recent RE Target, set in 2002, was met.

**Table 14.3: Water Quality Summary**

River Stretch	Sample Point	Test / Target	1998	1999	2000	2001	2002
Ise (Slade Brook to Pytchley Brook)	Burton Latimer Road Bridge	Chemical GQA	C	B	B	B	B
		RE Target	2	2	2	2	2
		Compliance	Marginal	Pass	Pass	Pass	Pass
		Biology GQA	C	B	B	B	B
Ise (Pytchley Brook to River Nene)	B571 Road Bridge	Chemical GQA	B	B	A	B	B
		RE Target	2	2	2	2	2
		Compliance	Pass	Pass	Pass	Pass	Pass
		Biology GQA	C	C	B	C	C

Chemical and Biology GQA: A (Very Good), B (Good), C (Fairly Good), D (Fair).

RE2: water of good quality and suitable for all fish species.

RE4: water of fair quality and suitable for coarse fish populations.

14.21 There are six consented discharges within the local area. Two of these are to Pytchley Brook, both from the sewage treatment works south east of Pytchley. In addition there are four consented discharges for private sewage, three into Hardwick Brook catchment and one into Little Harrowden Brook.

### Conservation Sites

14.22 There are no Special Protection Areas (SPAs), candidate Special Areas of Conservation (cSACs) or Ramsar sites within the local area. There are two Sites of Special Scientific Interest (SSSI) potentially vulnerable to a reduction in water quality or change in the hydrological regime. The first is Southfield Farm Marsh, an area of tall-grass washland in the floodplain of the River Ise, upstream of the proposed bypass and close to the existing A14. The second is Higham Ferrers Gravel Pits located to the south-east of the bypass, further downstream in the River Nene floodplain. This area is designated for its national ornithological value, particularly in relation to breeding birds. Both sites are potentially vulnerable to a reduction in water quality, accidental spillage or change to the hydrological regime.

### IMPACT DURING CONSTRUCTION

14.23 With any construction work undertaken close to a watercourse there is an inherent risk of surface water and groundwater contamination. Potential contaminants include fuel oils from mechanical plant, dirty water run-off from the site, cement, site disturbance within the river channel and general debris from the construction site. The deliberate or accidental discharge of polluting material into controlled waters is an offence under the Water Resource Act 1991 if undertaken without consent and could lead to major adverse impacts without mitigation.

- 14.24 The proposed bypass will traverse Pytchley Brook and Hardwick Brook (Figures 32 and 34). During construction of these crossings, there is a potential that flow within the watercourse could be affected or the channel may need to be temporarily blocked, which would increase the flood potential, locally, within the catchment. Any culverting or works affecting the flow of a watercourse requires the prior written consent of the Environment Agency under the terms of the Land Drainage Act 1991/Water Resources Act 1991. A Temporary Works Consent may also be required from the Environment Agency where construction involves the blockage of a channel.
- 14.25 Impacts associated with contaminants entering groundwater are likely to be relatively isolated compared with impacts associated with surface waters. However, once impacted groundwater is relatively difficult to remediate and contaminants can be relatively persistent. Whilst the route does not cross a groundwater Source Protection Zone, there are a relatively large number of licensed abstractions in the local area, including two from groundwater. The release of pollutants into groundwater close to these abstractions would potentially increase the significance of any impacts associated with the contravention of the Water Resources Act (1991).
- 14.26 The risk of pollution can be significantly reduced by the adoption of good working practices and strict adherence to the Environment Agency's Pollution Prevention Guidelines. The key guidelines are as follows:
- ◆ PPG 1 General Guide to the Prevention of Water Pollution;
  - ◆ PPG 5 Work in, near or liable to Affect a Watercourse;
  - ◆ PPG 6 Working at Demolition and Construction Sites;
  - ◆ PPG22 Dealing with Spillages on Highways;
  - ◆ PPG23 Maintenance of Structures over Water; and
  - ◆ Guidelines on silt pollution and how to avoid it.

### **MITIGATION MEASURES DURING CONSTRUCTION**

- 14.27 Mitigation measures should include the following:
- ◆ On-site availability of oil spill clean up equipment including absorbent material and inflatable booms for use in the event of an oil spill or leak;
  - ◆ Use of drip trays under mobile plant;
  - ◆ Sediment trapping matting installed downstream of any construction; activities adjacent to or over watercourses;
  - ◆ Preparation of incident response plans, prior to construction, which should be present on site throughout construction to inform contractors of required actions in the event of a pollution incident;
  - ◆ Timing of works close to watercourses should be such that they do not interfere with spawning fish;
  - ◆ Construction materials brought to site should be free from contaminated material, so as to avoid any potential contamination of the watercourse; and
  - ◆ Care should be taken to ensure that wet cement does not come into contact with river water. Cement should be poured in dry and consideration should be given to using fast-drying cement.

- 14.28 Any material imported for use in construction should be inert and free from contaminated material, so as to avoid any potential contamination of the watercourse.
- 14.29 Provided correct working procedures and practices are adopted, as outlined above, and care is taken to avoid pollution, the impact of the construction phase would be of negligible significance.

#### **IMPACT WHEN OPERATIONAL**

- 14.30 The water environment is important in terms of water supply, transport and dilution of wastewater, biodiversity, aesthetics, recreation, value to economy and conveyancing of flow and flood waters. The predicted impacts, and their significance, to these attributes of the water environment are summarised in the TAG Worksheet (Appendix A).
- 14.31 The operational phase of the proposed Scheme is predicted to have a negligible impact on most attributes of the water environment. However, there may be impacts of a minor magnitude on water quality (in the three brooks only), of a moderate magnitude on recreation and of a major magnitude on the local landscape. The latter impact has already been recorded in Chapter 9. The significance of impact refers to both the importance of the water environment and the impact of the road on it.
- 14.32 In terms of the designated sites, it is unlikely that the bypass would have any effect on the Southfield Farm Marsh SSSI as this site is upstream of the proposed route. Equally, the effect on flow reaching the gravel pits at Higham Ferrers from the River Ise is likely to be minimal as the site is located about 25km downstream, and therefore it is highly unlikely that any water of a deteriorated quality would reach the SSSI. Furthermore, on-site containment would aim to prevent water of deteriorated quality from reaching the site.
- 14.33 The results of the DMRB surface water quality assessment indicated that there would be some impact from highways runoff when flows are very low if no mitigation was included. The tests completed at the Q95 (low flow) level for zinc and copper showed that concentrations of both increased significantly under estimates of traffic flows from the design year. The water quality DMRB test was failed in the case of Little Harrowden Brook, assuming that the RE Target is 1 (the most stringent). The test was passed for Pytchley and Hardwick Brooks and dilution in the River Ise is sufficient to mean that there would be very little change in this larger receiving watercourse. Mitigation measures will significantly reduce any impact (see next section).
- 14.34 The probability of a serious accidental spillage leading to a serious pollution incident was conducted based on predicted traffic densities for the design year under an estimate of high growth. An RE 1 target was assumed for all calculations to provide a worst case scenario. The probability for the three brooks was very low, with all return periods equal to or greater than 1 in 134 years. The probability of a serious accidental spillage leading to a serious pollution incident on the River Ise was higher with a return period of 1 in 55 years. An emergency response time of over 20 minutes was assumed for all calculations. Notably, the risk at both proposed roundabouts is higher.

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## MITIGATION MEASURES WHEN OPERATIONAL

- 14.35 The water quality assessments indicate that there is likely to be some problems from road runoff when flows in the three brooks are exceptionally low. Although there will be little impact on the River Ise, the road would first drain to these tributaries and so pollution may be problematic due to limited dilution. Therefore, a system to remove the likely contaminants (such as heavy metals, suspended solids, chloride ions, organics and hydrocarbons) is recommended, ideally incorporating a reedbed type system which would provide additional benefits of habitat creation. This system is likely to mitigate the potential impact of the road runoff on the three brooks, as well as reducing the overall pollutant load to the River Ise. Maintenance of the system will be important to continue its effectiveness over the long-term.
- 14.36 Some attenuation of flows is recommended to prevent the potential flows entering the River Ise contributing to the flooding problems already experienced in Isham. Results from the Flood Risk Assessment suggest the construction of three balancing ponds to hold highways drainage. Notably, balancing ponds could also incorporate ecological features and might improve biodiversity in the medium-term.
- 14.37 Due to the presence of two roundabouts on the bypass, some method of pollution containment, such as oil and petrol interceptors and penstocks, is recommended for the drainage from these areas, especially at sensitive locations, including the crossing of Hardwick Brook.
- 14.38 Surface water from roads and impermeable parking areas should be discharged via trapped gullies.
- 14.39 Under the Water Resources Act 1991, the prior agreement of the Environment Agency is required for any dewatering or gravel washing activities to controlled waters, which would include the River Ise, Pytchley Brook, Hardwick Brook and Little Harrowden Brook.
- 14.40 Any facilities, above ground, for the storage of oils, fuels or chemicals shall be sited on impervious bases and surrounded by impervious bund walls. The volume of the bunded compound should be at least equivalent to the capacity of the tank plus 10%. All filling points, vents, gauges and sight glasses must be located within the bund. The drainage system of the bund shall be sealed with no discharge to any watercourse, or underground strata. Associated pipework should be located above ground and protected from accidental damage. All filling points and tank overflow pipe outlets should be detailed to discharge into the bund.

## SUMMARY

- 14.41 Overall, the proposed Isham bypass is likely to have a **slight adverse** impact on the water environment, as summarised in Worksheet A and the TAG Appraisal Summary Table.

## 15. ACCESSIBILITY

### INTRODUCTION

- 15.1 The Government's Transport White Paper sets the framework for a number of issues in relation to health and transport. It refers mainly to the encouragement of physical fitness by reducing reliance on private cars, thus making it easier to cycle and walk in safety.
- 15.2 This chapter considers the potential effects of the proposed routes on local journeys made by modes of transport other than the car, thereby assessing the impacts of the Scheme on personal activity. The potential for community severance is also considered.
- 15.3 The assessment considers three issues:
- ◆ Accessibility for pedestrians and cyclists;
  - ◆ Accessibility of public transport and access to the transport system;
  - ◆ Community Severance

### METHOD OF ASSESSMENT

- 15.4 The approach to this assessment is predominantly qualitative.
- 15.5 Access to the countryside via Public Rights of Way (PROW) provide important recreational interests for local residents. PROW are made up of footpaths, bridleways (which may be used by cyclists) and byways. These are illustrated in the Environmental Constraints Map. Each PROW has a reference number which was retrieved from the Definitive Rights of Way Map at Northamptonshire County Council (Figure 7).
- 15.6 A site visit was made to ascertain the existence of footpaths, cycleways and community facilities within the study area. Consultation was undertaken with the Public Rights of Way officers at Northamptonshire County Council. Pedestrian counts were undertaken on the Footpaths TH2, TH3, TH5, TM3, TM4, TM5, GW2 and Bridleway GW5 on 27 July 2004 (Appendix N).

### CRITERIA FOR SIGNIFICANCE OF IMPACT

- 15.7 The significance of the impact on rights of way has been determined by their level of use, reflected in part by the pedestrian counts and by the magnitude of potential impact (including the length of diversions and the change in amenity experienced by users). Both are derived from DMRB Volume 11, Section 3 Part 8.
- 15.8 The severance sub-objective, concerned with severance as it affects pedestrians, cyclists and equestrians, was assessed on the following criteria:
- ◆ **Neutral** – Little or no hindrance to pedestrian movement;
  - ◆ **Slight** – All people wishing to make pedestrian movements would be able to do so, but there would probably be some hindrance to movement;
  - ◆ **Moderate** – Some people, particularly children and old people, are likely to be dissuaded from making journeys on foot. For others, pedestrian journeys would be longer or less attractive;

- ◆ **Severe** – People are likely to be deterred from making pedestrian journeys to an extent sufficient to induce a reorganisation of their activities. In some cases, this could lead to the loss of certain facilities for a particular community. Those who do make journeys on foot would experience considerable hindrance.

## BASELINE CONDITIONS

### Public Rights of Way

- 15.9 Currently the village of Isham experiences a high degree of severance on the existing A509, due to the road almost splitting the village in two and as a result of the volume of traffic and the level of HGVs. This reduces the safety and accessibility for residents using other modes of transport other than the car.
- 15.10 The study area is predominantly agricultural land which is traversed by a number of public rights of way (Figure 7). These are used by non-motorised users to cross the valley via footpaths and bridleways, lanes as well as providing links between Isham and areas of employment in Burton Latimer. The following footpaths and bridleways are located to the west of Isham:
- ◆ Bridleway GW15 runs in an east to west direction between Pytchley and Burton Latimer;
  - ◆ Footpath GW2 runs in an east to west direction between Pytchley and Burton Latimer;
  - ◆ Footpath TM3 runs in a west to southeast direction between Pytchley and Isham;
  - ◆ Footpath TM4 runs in an east to west direction between Springfield and Isham;
  - ◆ Footpaths TM5/TK18 runs in a north to south west direction between the A509 Wellingborough Road south of Isham and B574 Hill Top Road, west of Hill Top.
- 15.11 Two sets of pedestrian counts were undertaken in July 2004, the results of which are detailed in Table 15.1 and included in Appendix N.

**Table 15.1: Pedestrian Counts for PROW**

PROW	GW15	GW2	TM3	TM4	TM5
21/07/04	0	0	22	5	0
27/07/04	0	0	69	19	2
Total	0	0	91	24	2

- 15.12 It is apparent from these results that footpath TM3 was the most heavily used PROW at the time of the survey.

### Public Transport Facilities

- 15.13 United Counties local bus service provides the following services, which run via Isham:
- ◆ Route 24 travels from Kettering to Wollaston Bozeat via Isham on Monday to Friday (6 trips) and one trip on a Saturday;

- ◆ Route X4 travels between Milton Keynes to Peterborough on Monday to Saturday (every 60 minutes) and three trips on a Sunday;
- ◆ Route X4 also travels between Northampton to Corby on Monday to Saturday (every 60 minutes) and one trip on a Sunday.

### **Settlements/Community Facilities**

- 15.14 The A509 links the two major settlements in the study area, Kettering and Wellingborough. Both are high level service centres, which attract commuters from throughout the study area, principally for work, but also for comparison shopping. The smaller settlement of Burton Latimer and villages of Isham, Pytchley, Orlingbury, Little Harrowden and Great Harrowden are also located within the vicinity of the route corridor. Many people living in these villages use the A509 to commute to Kettering and Wellingborough for employment purposes and travel between these smaller settlements, to avail of local services such as primary schools, shops, places of worship and community facilities.
- 15.15 The village of Isham includes a range of local community facilities such as local shops, post office, Isham Cofe Primary School, pubs etc. A number of rural farming enterprises are also located within the study area.
- 15.16 The River Ise Valley contains some industrial activity. The Weetabix factory lies on the outskirts of Burton Latimer, to the east of the railway. Finedon Road Industrial Estate is located north east of Wellingborough Town Centre. Furnace Lane Industrial Estate and the WEAST development is located to the north and northeast of Wellingborough

### **IMPACT DURING CONSTRUCTION**

#### **Accessibility for Pedestrians and Cyclists**

- 15.17 The proposed Isham bypass would sever five public rights of way that cross the study area. These include bridleway GW15 and footpaths GW2, TM3, TM4 and TW5/TK18. Construction of the bypass would significantly impact on their use and amenity, as the influx of heavy machinery, increase in noise and air emissions would collectively have an adverse impact on the existing rural ambience of the area. At times, it would be not be viable for non-motorised users to use this network to travel between Pytchley, Isham, Orlingbury and Little Harrowden, due to the health and safety issues during the construction phase.

#### **Accessibility of public transport and access to the transport system**

- 15.18 The existing public transport facilities would be maintained as construction of the bypass would not cause a great deal of disturbance along the existing A509. However, it would be likely that vehicular movement between Isham/Pytchley, Isham/Orlingbury and Little Harrowden/Hill Top would be slower as the construction phase progresses.
- 15.19 The construction of the bypass would not adversely impact on vehicular movement between the industrial estates at Burton Latimer, Furnace Lane Industrial Estate and Finedon Road.

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## Community Severance

- 15.20 It is likely that the village of Isham would experience an increase in traffic during the construction period, most likely from large machinery and construction vehicles. This would have a temporary adverse impact on the ambience of the area and safety.

## MITIGATION MEASURES DURING CONSTRUCTION

- 15.21 Temporary closure orders will be put in place on affected rights of way during the construction period. Where possible, safe diversionary routes will be provided.

## IMPACTS WHEN OPERATIONAL

### Accessibility for Pedestrians and Cyclists

- 15.22 The public rights of way, outlined in Paragraph 15.10 would experience a considerable loss in amenity value due to the introduction of new traffic in this area. It is likely that the existing noise and air quality would be adversely affected and overall amenity reduced. Views of the rural countryside would be adversely affected with the construction of a new road into an existing rural environment. Mitigation measures, as outlined below would serve to reduce these adverse impacts.

### Accessibility of public transport and access to the transport system

- 15.23 Access for residents to bus routes should be made easier and safer. In terms of access to the transport system, bus routes along the existing A509 are unlikely to vary with the introduction of the bypass. However, bus journey times and punctuality may improve slightly with the bypass due to anticipated reduction in congestion on the A509.

## Community Severance

- 15.24 The bypass would reduce the volume of traffic travelling through the village of Isham, which would result in a significant improvement to the environment of the village centre and in conditions for pedestrians and cyclists. This reduction would greatly reduce the community severance currently experienced in Isham, resulting in a much less hazardous environment. Local residents would experience a greater freedom on moving around the village and the likelihood of accidents should be reduced.

## MITIGATION MEASURES WHEN OPERATIONAL

- 15.25 The design of the bypass has taken account of the need to provide for the existing rights of way. This will involve the diversion of some rights of way to safe crossing points or provision of pedestrian overbridges. People wishing to use the rights of way will therefore be able to continue to do so with no hindrance to movement.
- 15.26 The following specific measures for each PROW will ensure that the end use of the footpaths and bridleway following construction of the bypass will not vary significantly from the existing use.
- ◆ Bridleway GW15 and Footpath GW2 will be diverted to combined pedestrian underpass/culvert on the Pytchley Brook, with an alternative diversion leading to an overbridge at the Ruts;

- ◆ The overbridge at The Ruts north of Fairfield Road will also provide for footpath TM3. Minor path diversions will be required to link the bridge into the footpath route;
- ◆ Diversions are proposed for TM4 on both the east and west sides of the Scheme, which will take users over the Orlingbury Road bridge;
- ◆ Footpaths TK18/TM5 will be diverted to cross an overbridge west of Ashpole Plantation;
- ◆ Immediately south of Hill Top roundabout, an overbridge will be provided to allow non-motorised users to cross the bypass in safety.

### **SUMMARY**

- 15.27 The implementation of the above mitigation measures will ensure that there should be no hindrance to movement. Minor diversions to PROW should result in no more than slight adverse impacts on the non-motorised users of those routes directly affected by the Scheme.
- 15.28 The existing degree of severance will be significantly reduced through the village of Isham with the provision of a bypass and the community to some extent can 'claim back' its village amenities. Pedestrians, cyclists and residents should feel safer with the reduction in volumes of traffic. Overall impact on accessibility is therefore assessed as **beneficial**.

## 16. PHYSICAL FITNESS AND JOURNEY AMBIENCE

### INTRODUCTION

- 16.1 This chapter considers how the A509 Isham Bypass would meet the Government's objectives in relation to health and transport set out in the Government's White Paper.
- 16.2 In terms of physical fitness, an assessment was made of the impact of the bypass on physical fitness, by evaluating the changes in the opportunities for increased physical activity through cycling and walking.
- 16.3 Journey ambience relates to the quality of the journey and can be affected, positively or negatively, by travellers themselves and by the surrounding areas. Journey ambience is assessed through three factors: traveller care, traveller's views and traveller stress.
- ◆ Traveller care refers to the facilities that improve en-route ambience including lay-bys, service areas and travel information provided along the route.
  - ◆ Traveller views refer to the extent to which travellers can see the surrounding landscape and townscape and have an impact on the attractiveness of the general travelling environment. A high quality view can help to relieve traveller stress.
  - ◆ Traveller stress is the adverse mental and physiological effects experienced by travellers. Frustration, fear of potential accidents and route uncertainty can influence levels of traveller stress.

### METHOD OF ASSESSMENT

- 16.4 The assessment is predominantly a qualitative one and was carried out by utilising methods set out under TAG (Section 3.3.12). The key objective is to identify the contribution of the Scheme to overall health by increasing the level of physical activity. The recommended minimum level of activity for adults is 30 minutes or more of moderate activity, most days of the week.

### CRITERIA FOR SIGNIFICANCE OF IMPACT

- 16.5 The significance of impact will be determined by the following scale:
- ◆ Large beneficial – large number of people undertaking 30 minutes or greater physical activity per day;
  - ◆ Moderate beneficial – large number of people undertaking at most 30 minutes daily activity per day;
  - ◆ Slight beneficial – small number of people undertaking at most 30 minutes daily activity per day.

### BASELINE CONDITIONS

- 16.6 The high level of traffic travelling through Isham discourages walking and cycling by residents making short visits to local shops and schools, which has a negative effect on personal fitness. Furthermore, a number of public rights of way located to the west of Isham would be impacted by the bypass. These are described in Chapter 15.

- 16.7 Journey ambience for travellers on the A509 through Isham is adversely affected by the stress of dealing with a large volume of traffic on a route designed to carry a lesser volume of traffic. However, travellers can avail of views of the village centre, which is a designated conservation area.

## **IMPACT DURING CONSTRUCTION**

### **Physical Fitness**

- 16.8 There is likely to be a large amount of machinery in operation in the vicinity of Isham during the construction of the scheme. This would result in a hazardous environment for pedestrians and cyclists, which would adversely influence opportunities for, and levels of, physical fitness. Furthermore, the public footpaths located to the west of Isham would be adversely impacted during the construction phase.

### **Journey Ambience**

- 16.9 Journey ambience refers to traveller care, traveller's views and traveller stress. These would be negatively impacted by the volume of HGVs, construction machinery and associated plant which would be present during the construction phase of this scheme. It is anticipated that as a result of this all aspects which would facilitate a pleasant journey would be adversely impacted upon.
- 16.10 Views over open landscape would be adversely impacted. Route uncertainty could result due to local diversions, and temporary closure of routes.

## **MITIGATION MEASURES DURING CONSTRUCTION**

- 16.11 Temporary closure orders will be put in place on affected rights of way during the construction period. Where possible, safe diversionary routes will be provided.

## **IMPACTS WHEN OPERATIONAL**

### **Physical Fitness**

- 16.12 The key objective of this indicator is the contribution of the proposal to overall health by increasing levels of physical activity.
- 16.13 The implementation of a bypass Scheme for the village of Isham would reduce the number of vehicles travelling through the village. This would encourage people in the village to walk and cycle more, in relative safety, which could foster well-being and promote community spirit, all which can have positive implications for health.
- 16.14 There would be no special provision for cyclists or other non-motorised users on the Scheme due to the speed and volume of traffic which would use the dual carriageway. These users would be encouraged by signage to use the relieved section of A509 through Isham village.
- 16.15 Impact on public footpaths located to the west of Isham would be mitigated against, which would ensure no significant long-term adverse impacts.

### Journey Ambience

- 16.16 The Scheme would reduce driver frustration, which contributes to traveller stress as dualling would help to increase the average speed of vehicles travelling along the road and increase the opportunity for over-taking of slower moving vehicles. The Scheme would reduce the fear of accidents which can also contribute to traveller stress and reduce potential pedestrian/vehicle conflict and turning movements in Isham village. Although the Scheme would increase flow and speed of traffic which are factors resulting in fear, the widening of the road would produce better and safer opportunities for overtaking, would be built to a superior design standard, and would offer a better alignment and a higher quality road surface.
- 16.17 Route uncertainty would not be affected as route specific and general road signage will be provided in accordance with the DETR's guidelines for road building.
- 16.18 The Scheme incorporates two lay-bys which would provide an appropriate level of traveller care on the route.

### SUMMARY

- 16.19 The Scheme does not incorporate provision for pedestrians or cyclists. However, it should result in an increase in the number of cyclists and pedestrians within Isham, due to the reduction of traffic. The overall impact of the Scheme in terms of improving potential for physical fitness is assessed as **slight beneficial**.
- 16.20 The overall impact of the proposal on journey ambience for the traveller is assessed as slight to moderate **beneficial**.
- 16.21 A summary of the assessment of the bypass proposal is included in the TAG worksheet in Appendix A.

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## 17. INTEGRATION

### INTRODUCTION

- 17.1 This chapter examines the proposed A509 Isham bypass in terms of transport and planning policies at a national, regional and local level. It assesses the extent to which the objectives of the policies would be facilitated or hindered by the proposed routes.

### METHOD OF ASSESSMENT

- 17.2 The policy assessment was carried out in accordance with TAG and the Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment.

### CRITERIA FOR SIGNIFICANCE OF IMPACT

- 17.3 The significance of planning policies have been determined by the status of the development plan and the conformity of such policies with regional and national planning policy objectives. In general, planning policies of relevance to the Scheme will be of equal significance.
- 17.4 The magnitude of impacts on planning policy will be determined by the degree to which the policy objectives are facilitated or hindered by the proposed scheme.

### BASELINE CONDITIONS

- 17.5 A desk study has been undertaken to review the following key planning and transport policy documents:
- ◆ Integrated Transport White Paper (1998);
  - ◆ Planning Policy Statement (PPS1): Delivering Sustainable Development (2005)
  - ◆ PPS 7: Sustainable Development in Rural Areas (2004)
  - ◆ PPG 9: Nature Conservation (2001);
  - ◆ PPS11: Regional Spatial Strategy (2004);
  - ◆ PPG12: Development Plans (1999);
  - ◆ PPG13: Transport (2001);
  - ◆ PPG15: Historic Environment (1994);
  - ◆ PPG16: Archaeology and Planning (1990);
  - ◆ PPG24: Planning and Noise (1994)
  - ◆ PPG25: Development and Flood Risk (2001);
  - ◆ Regional Spatial Strategy 8: East Midlands (2005);
  - ◆ Milton Keynes South Midlands Sub Regional Strategy (2005);
  - ◆ Sustainable Communities Plan 2003;
  - ◆ Northamptonshire County Structure Plan (2001);
  - ◆ Northamptonshire Local Transport Plan (2001);
  - ◆ Kettering Local Plan (1995);
  - ◆ Wellingborough Local Plan (1999);

- ◆ Wellingborough Local Plan Alteration (Adopted 2004);
  - ◆ Northamptonshire Minerals Local Plan 1991-2016.
- 17.6 The proposed bypass is located within the county of Northamptonshire, and is subject to the Northamptonshire County Structure Plan (2001) and the Northamptonshire Minerals Local Plan (1991-2016). The local planning framework is provided by the Wellingborough Local Plan (1999), Wellingborough Local Plan Alteration (2004) and Kettering Local Plan (1995).
- 17.7 With respect to the local plan review process, Kettering Borough Council published a Key Issues Report following consultation in 2002 on a series of Issues Papers. However, in the light of new planning legislation which is due to come into effect shortly and the changing regional planning context, the Council has concluded that the most cost-effective and practical way forward is to not continue with the Local Plan. Instead, it will work the preparation of a draft Local Development Framework.
- 17.8 In March 2002, the Borough Council of Wellingborough published the Borough of Wellingborough Local Plan Alteration Revised Deposit 2002 which considers the housing and employment requirements for Wellingborough town between 1996 and 2016. The other policies of the adopted plan remain unaltered. A public inquiry was held in November 2002 and following a final set of modifications it was adopted in 2004.

### National Planning Policy

- 17.9 National planning objectives relevant to the bypass can be summarised as follows:
- Planning Policy Statement 1 – Delivering Sustainable Developments (2005)*
- 17.10 Planning Policy Statement (PPS) 1 sets out the Government's vision for planning and the key principles which should underpin the planning system. The government believes "the country needs a simpler, more flexible, more predictable, efficient and effective system that will deliver the quality development needed to secure sustainable communities. A positive, proactive approach to planning is needed to achieve this" (ODPM, March 2004).
- 17.11 PPS 1 outlines four aims for sustainable development in its strategy A Better Quality of Life, a Strategy for Sustainable Development in the UK. These are as follows:
- ◆ Maintenance of high and stable levels of economic growth and employment;
  - ◆ Social progress which recognises the needs of everyone;
  - ◆ Effective protection of the environment;
  - ◆ The prudent use of natural resources.
- 17.12 Planning authorities should attain outcomes which should enable economic, environmental and social objectives to be realised. Should extra weight be placed on one particular sustainability objective, it is important that the reasoning for doing so is explicitly substantiated and impacts should be avoided or mitigated wherever possible.

*Planning Policy Statement (PPS) 7: Sustainable Development in Rural Areas (2004)*

- 17.13 PPS7 (Sustainable Development in Rural Areas) replaces PPG7 (The Countryside – Environmental Quality and Economic and Social Development). The objectives as per PPS7 for rural areas aims to raise the quality of life and the environment in rural areas; promote sustainable patterns of development; improve economic performance; and promote sustainable, diverse and adaptable agricultural sectors.

*PPG9: Nature Conservation (1994)*

- 17.14 PPG9 states that there is a need to balance adequate provision for development and economic growth whilst ensuring effective conservation of wildlife and natural features. With careful planning and control, conservation and development can be compatible. Proximity to a designated area, such as a Special Site of Scientific Interest, does not always mean that development proposals will be refused. They could be approved if planning conditions can effectively limit any impact on habitats or important physical features.
- 17.15 PPG9 further recognises the importance of local nature conservation and acknowledges that wildlife heritage is not confined to designated sites.

*PPS11: Regional Spatial Strategies 2004*

- 17.16 PPS11 replaces PPG11 Regional Planning (2000). The main principles of Regional Spatial Strategies are to improve policy delivery at the regional level and contribute to the culture change necessary to deliver the Government's Sustainable Communities Plan. It should take into account identification of the scale and distribution of provision for new housing; priorities for the environment, such as countryside and biodiversity protection; and transport, infrastructure, economic development, agriculture, minerals extraction and waste treatment and disposal.

*PPG13: Transport (2001)*

- 17.17 PPG13 states that there is a need to integrate planning and transport at the national, regional and local level to promote more sustainable transport choices, to promote accessibility, and to reduce the need to travel, especially by private car.
- 17.18 It further states that great care must be taken to minimise the impact of any new transport infrastructure projects, or improvements to existing infrastructure, on both the natural and built environment. This includes the potential impacts caused during construction.

*PPG15: Planning and the Historic Environment (1994)*

- 17.19 PPG15 states that local highway and planning authorities should integrate into their policies measures to avoid and minimise the impacts of new transport infrastructure developments on the various elements of the historic environment and their settings. New roads should, wherever possible, be located away from listing buildings, conservation areas and other historic sites. However, in each case, a suitable balance should be struck between conservation, other environmental concerns, economics, safety and engineering feasibility. PPG15 is intended to complement the guidance on archaeology and planning given in PPG16.

### *PPG16: Archaeology and Planning (1990)*

- 17.20 This planning policy guidance sets out the government's policy on archaeological remains on land and how they should be preserved or recorded both in an urban and rural setting. PPG16 acknowledges that there should always be a presumption in favour of preserving nationally important archaeological remains "in situ" whether scheduled or un-scheduled. It outlines that where it is not feasible to preserve the remains, "an archaeological excavation for the purposes of preservation by record may be an acceptable alternative" (Paragraph 13).

### *PPG24: Planning and Noise (1994)*

- 17.21 PPG 24 sets out how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business. The impact of noise on the Countryside and on designated Nature Conservation sites is also considered.

### *PPG25: Development and Flood Risk (2001)*

- 17.22 PPG25 seeks to ensure that flood risk is properly taken into account in the planning of developments to reduce the risk of flooding and the damage which floods can cause. Consideration should be made to "the specific risk of flooding to the development being proposed over its current expected lifetime and its possible effects on flood risks elsewhere in terms of its effects on flood flow, flood storage capacity and the run-off implications".

### *Integrated Transport White Paper 1998*

- 17.23 The Government's White Paper on the future of transport, 'A New Deal for Transport: Better for Everyone', published in July 1998, highlights the need for an integrated approach to transport policy. The criteria which are fundamental to achieving a more strategic and broad approach to transport planning is as follows:
- ◆ Integration – ensuring that decisions are taken in the context of a coherent, integrated transport policy covering all modes;
  - ◆ Accessibility – making it easy to reach the places we wish to get to;
  - ◆ Safety – making travel safer;
  - ◆ Economy – obtaining good value for money and supporting sustainable economic activity in appropriate locations; and
  - ◆ Environment – considering both the positive and negative effects on the built environment, at a global, regional and local scale.

## **Regional Policy**

### *Regional Spatial Strategy for the East Midlands (RSS8) (2005)*

- 17.24 The Regional Spatial Strategy for the East Midlands aims to achieve the following regional transportation objectives:
- ◆ Support sustainable development in the region's Principal Urban Areas and Sub-Regional Centres described in Policy 5.
  - ◆ Promote accessibility and overcome peripherality in the region's rural areas in support of Policy 6.
  - ◆ Support the region's regeneration priorities outlined in Policy 21.

- ◆ Promote improvements to inter-regional and international linkages that will support sustainable development within the region.
- ◆ Improve safety across the region and reduce congestion, particularly within the region's Principal Urban Areas and on major inter-urban corridors.
- ◆ Promote opportunities for modal shift away from the private car and road based freight transport across the region.

17.25 The Isham bypass Scheme would contribute to achieving the first objective in maintaining good transportation links between Kettering and Wellingborough which are both identified as growth towns in Policy 5. The scheme would improve links between the rural settlements of the Harrowdens and Isham and the principal towns and their facilities and services in accordance with policy 6. It would maintain good transportation links within the Sub-Region and improve access to the inter-regional and international links afforded by A14. The scheme would reduce the existing community severance experienced by Isham and improve highway safety as well as benefiting its overall environmental amenity. This would indirectly encourage the usage of modes of transport other than the car. It would have a neutral impact in facilitating choice of freight movement.

#### *Sustainable Communities Plan 2003*

17.26 The Government's Sustainable Communities Plan was launched in February 2003 and sets out a long-term programme of action for delivering sustainable communities in both urban and rural areas across. It provides the tools to build successful, thriving and inclusive communities, which:

- ◆ are economically prosperous;
- ◆ have decent homes at affordable prices;
- ◆ safeguard the countryside;
- ◆ enjoy a well-designed, accessible and pleasant living and working environment;
- ◆ are effectively and fairly governed with a strong sense of community.

17.27 The Sustainable Communities Plan identifies four growth areas in the wider south-east. One of these is the Milton Keynes and South Midlands (MKSM) location which fully encompasses Northamptonshire.

#### *Milton Keynes South Midlands Sub Regional Strategy (2005)*

17.28 The Milton Keynes and South Midlands Sub-Regional Strategy will take forward the growth aspirations contained in the Sustainable Communities Plan through setting out a clear agreed long-term spatial vision for the sub region to 2021 and providing guidance on the scale, location and timing of development and associated transport, employment and social infrastructure. The draft Strategy was issued in July 2003 and was subject to an independent public examination in March/April 2004. The final Strategy was approved in March 2005.

- 17.29 Strategic Policy 1 details Corby/Kettering/Wellingborough as growth towns. It is envisaged that an increase of 34,100 dwellings will be accommodated in this area by 2021. A total of 8,000 dwellings will be accommodated through sustainable urban extensions to the east, north and west of Wellingborough. This residential development will necessitate an increase in a range of quality employment opportunities. High quality public transport services will be essential across the area, to connect key centres of housing, employment, leisure and retail activity.
- 17.30 Paragraph 23 notes that the movement needs of the growth area will increase in future, placing further demands on congested roads and inadequate infrastructure. One of the priorities is identified as investing in highway improvements to ensure that strategically important movements are carried out efficiently.
- 17.31 Paragraph 24 states that, notwithstanding the priority for reducing the Sub-Region's dependence on increasing road traffic, and for moving to more sustainable travel patterns, the growth area aspirations will require significant infrastructure investment. If these requirements are not met, additional measures are likely to be required to achieve the levels of housing and economic growth envisaged.
- 17.32 The A509 Wellingborough – Kettering dualling, including the A509 Isham Bypass is highlighted as one of the transport schemes to be implemented in 2007-11.

*Northamptonshire Local Transport Plan 2001*

- 17.33 The Northamptonshire Local Transport Plan (LTP) outlines a five year programme from April 2001 to March 2006. The LTP sets out eight transport objectives which integrated transport strategies are intended to address:
- ◆ To reduce the number and severity of road traffic accidents;
  - ◆ To improve access to workplaces and other facilities for all the population including people with disabilities, the very young, the elderly and people on low incomes;
  - ◆ To minimise the local impact of traffic on the environment;
  - ◆ To maintain and improve the vitality and viability of the town centres;
  - ◆ To increase bus patronage amongst former car users and people who currently experience low levels of access to facilities;
  - ◆ To increase the number of trips made by cycling and walking;
  - ◆ To reduce the total amount of travel by private car;
  - ◆ To reduce delays suffered by road users essential to Northamptonshire's prosperity.
- 17.34 The plan divides the county of Northamptonshire into five sub-areas. The Isham Bypass falls within the eastern sub area. The Plan recognises that Isham and Great Harrowden on the A509 continually suffer from the effects of traffic travelling between Wellingborough, the A14 and Kettering. It states that a publicly funded bypass for Isham is currently being evaluated by the County Council as one of the top two priority schemes decided in 2001.

17.35 Paragraph 3.3.2 of the LTP refers to Highway Safety, Congestion and Opportunities states that the “Geddington and Weekley on the A43/A4300, and Isham on the A509, continue to suffer from the effects of through traffic. Bypasses for Geddington and Isham are two of the major highway schemes currently being evaluated by the County Council”.

*Northamptonshire County Structure Plan (2001)*

17.36 The County Structure Plan was adopted in March 2001. Following a legal challenge a number of policies relating to a Strategic Development Area in Northampton were subsequently quashed. The Structure Plan is a strategic land-use framework which guides development in Northamptonshire up to 2016.

17.37 A planned review of the structure plan was abandoned in September 2003 due to the timing of the emerging Planning and Compulsory Purchase Bill, the alteration to Regional Planning Guidance and the Draft Milton Keynes and South Midlands Sub-Regional Spatial Strategy. Those policies in the adopted Structure Plan which are relevant to the Isham Bypass proposals are detailed in the following paragraphs.

17.38 The Northamptonshire Structure Plan Deposit Draft (April 1999) made reference to the Isham Bypass, located within the northern sub area and which was due for implementation during the plan period. The Northamptonshire County Structure Plan 2001 does not refer to the implementation of the A509 Isham Bypass during the plan period.

*Transport*

17.39 The aim of the County Structure Plan in terms of transport policy is to develop area-based integrated transport strategies.

17.40 Policy T1 outlines a Countywide Integrated Transport Strategy which will be pursued across the county aimed at promoting means of transport other than the private car and reducing the growth in the number and length of motorised journeys. Policy T2 outlines integrated transport strategies which have been developed for each of the following sub areas: Northampton; Northern; Eastern; Southern; and Western.

17.41 Policy T3 highlights the primary road network in Northamptonshire on which long and medium distance road traffic will be encouraged to use. This refers to the A509 as a Strategic Road.

17.42 Policy T5 refers to major new road improvements which may be necessary for a variety of reasons. It states that proposals for improvement to the road network will undergo rigorous assessment as outlined below. Major new road improvements, including road schemes, widening and traffic relief schemes, will only be permitted where they will provide an overall benefit taking account of the following five criteria:

- ◆ Environmental Impact;
- ◆ Safety;
- ◆ Economy;
- ◆ Accessibility;
- ◆ Integration.”

- 17.43 The Isham Bypass has been considered against criteria outlined in Policy T5 relating to environmental impact such as protecting the natural and built environment, contribution to safety, sustainable economic growth, accessibility and, in particular, to integration, ensuring that decisions are taken in line with the principles of integrated transport. Paragraph 12.29, supporting text to Policy T5, states that despite considerable improvement to the road network in Northamptonshire, problems of congestion and safety remain, particularly in certain locations adversely impacting on particular communities. Paragraph 12.30 states that there could be further road improvements other than those outlined in Policy T2 which will be an appropriate response to issues of congestion and safety and which may be forthcoming for implementation during the plan period.
- 17.44 Policy T8 supports measures to encourage walking and cycling including providing safe and easy access for pedestrians and cyclists.
- 17.45 With regard to the East Wellingborough Strategic Development Area Policy SDA1 refers to accommodating additional industrial and commercial development to meet the needs of a growing population. The Structure Plan allocation for the Wellingborough district refers to 7,000 housing units (Policy H1) and 160ha of commercial and industrial uses (Policy IC1). Provision will be made for the construction of 8,500 dwellings in Kettering (Policy H1) and 210ha of industrial and commercial use.

#### *Special Landscape Areas*

- 17.46 Policy AR 1 states that landscapes that are distinctive in terms of their special character and quality will be identified in Local Plans. Northamptonshire has no national landscape designations such as Areas of Outstanding Natural Beauty or National Parks. However, it does contain distinctive landscapes that are of particular importance because of their special character and quality which require a special policy approach, termed Special Landscape Areas.
- 17.47 The scheme does not affect any Special Landscape Areas. Special Landscape Areas have been designated in Kettering Borough around Braybrooke, Stoke Albany and Boughton Park.

#### *Landscape Character*

- 17.48 Policy AR 2 states that the landscape character, which will be defined in Local Plans, of the whole County will be conserved and enhanced. A landscape character assessment will be conducted of the whole County that will include a comprehensive review of the special landscape areas in line with PPG7. This process will take account of the defining characteristics of each local area including the landscape, local buildings, interests of acknowledged importance, settlement form, and local building traditions and materials. Development proposals will respect the local character and distinctiveness of the landscape.

### *Biodiversity*

- 17.49 Policy AR3 states that development will not be permitted which would adversely affect statutory designated sites, including sites of special scientific interest, national nature reserves, local nature reserves, regionally important geological sites, county wildlife sites, wildlife corridors and sites which support species and habitats protected by specific legislation, unless the needs for the development outweighs the adverse impact. Only in exceptional circumstances will developments which would adversely affect these sites be permitted.
- 17.50 Policy AR3 also recognises the importance of protecting specific species vulnerable to land-use change. Local planning authorities should have regard to relevant legislation on protected species and the 'Northamptonshire Biodiversity Action Plan (BAP) in determining development proposals.

### *Biodiversity Measures in Local Plans*

- 17.51 Policy AR4 states that local plans will identify measures to help protect and enhance sites and features important for biodiversity and opportunities for creating new habitats.
- 17.52 In addition to designated sites, there are many other habitats which are important in terms of biodiversity in Northamptonshire. These include woodlands, trees, hedgerows, various types of grassland, wetlands as well as wildlife corridors. Where possible, these will be protected and enhanced. However, where loss or damage is unavoidable measures will be undertaken to recreate biodiversity.

### *Cultural Heritage*

- 17.53 Policy AR6 states that development will not be permitted where it would adversely affect nationally important archaeological sites and monuments and their settings, whether scheduled or not, conservation areas and listed buildings; registered parks and gardens; registered battlefields and protected hedgerows. There are exceptions to this policy if the need for the development outweighs the adverse impact.

### *Agriculture*

- 17.54 Policy AR7 states that, development will not be permitted if it would result in the loss of best and most versatile agricultural land. There are exceptions to this policy where "development will be permitted on the best and most versatile agricultural land where there is an overriding need, and either sufficient land in lower grades is unavailable, or available land in lower grades represents an important environmental resource and outweighs agricultural considerations". The majority of the study area is classified as Grade 2 and 3a agricultural land.

### *Flood Protection and Flood Risk Reduction*

- 17.55 Policy AR8 refers to flood protection and states that 'development will not be permitted in areas at direct risk from flooding, or where it would be likely, individually or cumulatively, to increase the number or extent of people, land or properties at risk from flooding elsewhere, unless adequate measures are taken to mitigate the effects'. Policy AR8 recognises the importance of floodplains and development will not normally be permitted in areas at direct risk of flooding or where it would indirectly increase the risk of flooding elsewhere.

### *Water Resources*

- 17.56 Policy AR9 seeks to protect water resources from adverse development and water resources should be conserved and managed appropriately.

### *Mineral Resources*

- 17.57 Planning permission will not be granted for development which would sterilise economically workable mineral deposits unless the mineral can be extracted prior to development (Policy MR3).

## **Local Planning Policy**

### *Kettering Local Plan (1995)*

- 17.58 The adopted Local Plan provides the basic land use framework for the enhancement and protection of the environment and has a number of strategies aimed at achieving this objective.

### *Nature Conservation*

- 17.59 There are a number of nature conservation sites outlined in the Kettering Local Plan located within the study area. These include Southfield Farm and Burton Latimer Pocket Park to the west of Burton Latimer. Policy 18 states that 'planning permission for development which would, directly or indirectly, adversely affect sites of geological, landscape or nature conservation importance, especially sites of special scientific interest and other statutory designations, will not be granted'.
- 17.60 The majority of the land within the study area is classified as Grade 2 or 3a (very good quality) agricultural land. Policy 11 states that 'Planning permission will not normally be granted for proposals for forms of development which would result in the permanent loss of land included in Grades 2 and 3 unless there is no suitable alternative site of lesser agricultural value capable of accommodating the proposed development; and there is an overriding and clearly demonstrated need locally, regionally or nationally for the development proposal'.
- 17.61 Policy 13 seeks to protect the water environment. Proposals for development which adversely affect the quality of the water and the environment of water features will not be permitted. Policy 14 seeks to enhance the water environment through the promotion of river corridors as important areas of open land and public access and through the conservation and enhancement of wildlife, landscape and archaeological features associated with rivers, ponds and lakes.

### *Cultural Heritage*

- 17.62 The town of Burton Latimer and village of Pytchley are designated conservation areas as outlined in the Local Plan. Policy 22 states that development in conservation areas would be subject to strict conditions relating to the granting of planning permission. The underlying aim of conservation areas is to apply sensitive application of all planning powers within these areas.

- 17.63 Policy 25 states that planning permission for development which would adversely affect a scheduled ancient monument, designated area of archaeological significance or a site of county-wide importance will not be permitted". Policy 25 recognises that planning conditions can be imposed ensuring that provision is made for archaeological investigation, recording and preservation in situ of remains "in advance of or, where necessary, during development".

#### *Transport*

- 17.64 Policy 78 specifically refers to the A509 Isham Bypass as part of the Strategic Road Network and as a 'protected route corridor' within the Local Plan. Policy 78 states that "planning permission will not be granted for development which would prejudice the proposed improvements to the strategic road network and enhance accessibility to the Borough".
- 17.65 Policy 29 refers to the railway environment. It states that provision will be made to carry out a comprehensive survey of the lineside environment with an aim to establish a joint programme, with Railtrack, of environmental improvement and enhancement works. Proposals for development adjoining the route of the railway should make a contribution to the improvement of the lineside environment and proposals which prejudice this implementation of improvements to the railway environment will not be permitted. The Midland Railway Line runs to the east of the study area, linking London St. Pancras to Manchester.

#### *Employment*

- 17.66 An area of land located to south west of Kettering Town Centre has been allocated for employment. This area is immediately north of the junction of the A14 and A509 where the route of the Isham Bypass commences.

#### *Wellingborough Local Plan (1999)*

- 17.67 The current Wellingborough Local Plan covers the period up to 2006. A partial review was undertaken in 2001 to take account of the latest government guidance and the requirements for the Northamptonshire Structure Plan. It was formally adopted in 2004. This review essentially examined housing and employment requirements of Wellingborough town between 1996 and 2016. The other policies of the adopted plan remain unaltered.

#### *Transport*

- 17.68 The A509 Isham Bypass is supported in the Wellingborough Local Plan. Policy T1 specifically refers to the A509 Isham Bypass and states that planning permission will not be granted for development which would prejudice the construction of the Isham Bypass. The Borough will also support the County Council in securing comprehensive traffic relief measures for Isham, Great Harrowden and the eastern side of Wellingborough.

#### *Water*

- 17.69 Policy G2 states that "unless flood protection and mitigation measures appropriate to compensate for the impact of the development are provided, planning permission will be refused for development within the floodplains; in other areas at risk of flooding; or which will increase the risk of flooding elsewhere; or result in problems due to additional surface water run off".

- 17.70 There is a flood protection area located to the east of Isham running from Burton Latimer, southwards through the Borough of Wellingborough.

#### *Nature Conservation*

- 17.71 Policy G17 states that, “planning permission will not be given for development which would adversely affect the essential characteristics of any site of special scientific interest or local nature reserve”. There are no SSSI’s or local nature reserves impacted by the Isham bypass.
- 17.72 There are a number of sites of nature conservation value within the study area. Policy G6 outlines local planning policy for the open countryside in recognition of its value and vulnerability. The general presumption is that development will not be permitted unless it cannot be accommodated elsewhere; appropriate landscape screening is put in place to minimise its adverse impact; and it will not result in the urban growth of Northampton to the east or Wellingborough to the west; nor will it result in further associated development.
- 17.73 Policy G18 states that, “planning permission will not be granted for development which would adversely affect a site designated as a ‘site of nature conservation value’ except where there is no suitable alternative site for the development and the proposal includes satisfactory mitigating measures to reduce its impact upon the special interest of the site”.
- 17.74 The majority of the study area comprises of open countryside. Woodlands, trees and hedgerows are recognised as major elements of amenity in addition to their nature conservation importance. Policy G21 seeks to ensure their protection wherever possible and states that, “development will be refused if it would result unnecessarily in the loss of or damage to any woodland, tree covered by a tree preservation order or hedgerows”. The extent to which the Isham proposal affects woodlands, trees and hedgerows is set out in Chapter 9.
- 17.75 Policy A1 states that there is a presumption against development which would involve the irreversible loss of Grades 1, 2 and 3a agricultural land. The majority of the study area is classified as Grade 2 or 3a agricultural land.

#### *Cultural Heritage*

- 17.76 The villages of Isham and Finedon are designated conservation areas due to their special architectural or historic interest. Policy G12 states that, “proposals for new buildings, or alterations to existing buildings or other structures in a conservation area will be refused unless the development by reason of its scale, siting, design and the use of materials will preserve or enhance the special qualities of the area and its setting”.
- 17.77 Policy G13 states that proposals for development adjacent to a conservation area will not be permitted if they would adversely affect the setting of the conservation area.
- 17.78 Great Harrowden Hall is a Grade I Listed Building, located within substantial grounds. Such grounds on the edge of settlements and are a notable feature within the rural landscape. Parts of these grounds are included in the Register of Historic Parks and Gardens. Finedon Hall is classified as a Grade II Listed Building. Policy G20 states that, “development in the grounds adjoining Historic Halls or within Historic Parks and gardens will not be granted planning permissions” other than in exceptional cases.

- 17.79 Policy G14 refers to the protection of archaeological remains where the presumption is in favour of the preservation of remains in situ. In exceptional cases development would normally be refused if this is not achievable. Excavation and recording is permissible, prior to agreement.
- 17.80 The local plan recognises the importance of countryside recreation and seeks to protect public rights of way particularly in the countryside. Policy L14 states that “planning permission for development proposals will be conditional upon the protection of existing public rights of way. It further states that in appropriate cases, negotiations will be instigated with a view to introducing new public rights of way”.
- 17.81 Policy G1 requires that known mineral reserves in the area should not be unnecessarily sterilised.

### *Employment*

- 17.82 Policy E1 states that within industrial estates, which include Finedon Road, Ise Valley, Park Farm (north and south) proposals for industrial and commercial uses will normally be permitted. Finedon Road Industrial Estates abuts residential areas and safeguarding conditions may be imposed for amenity reasons.
- 17.83 Land located to the east of Wellingborough has been granted planning consent for industrial development. To meet Structure Plan requirements, two further sites have been allocated; 12 hectares of land within the Wellingborough East development which will be dependent upon the construction of the Eastern Bypass. A second site comprising of 10 hectares, lies to the north east of Finedon Road Industrial Estate and has recently been granted planning permission.
- 17.84 The villages of Isham, Great Harrowden, Little Harrowden and Orlinbury are designated through Policy G4 as restricted infill villages. Development will be granted within the village policy lines if it would not either individually, or cumulatively impact with other proposals, have an adverse impact on the size, form, character and setting of the village and its environs.

### *Wellingborough Local Plan Alteration (2004)*

- 17.85 The Borough of Wellingborough Local Plan was adopted in April 1999 with a plan period to 2006. By the date of adoption the County Council had commended a review of the Northamptonshire County Structure Plan in order to establish a long-term vision for the future growth of Northamptonshire between 1996 to 2016. As a result the Borough Council decided to prepare a Local Plan Alteration that would cover the period to 2016. Following a Public Local Inquiry in 2002, the Borough of Wellingborough Local Plan Alteration was adopted in March 2004.
- 17.86 Reference is made to the Isham Bypass in Policy T1. It states that planning permission will not be granted for development which would prejudice the construction of the Isham Bypass as shown on the Proposals Map.

- 17.87 Wellingborough East is referred to in the Alteration Deposit Draft as a Strategic Development Area and will comprise of 110.8 hectares of employment land, 2875 dwellings and 9 hectares of leisure uses, associated community facilities, open space and infrastructure. Proposals for individual sites should include safe and convenient access links between all parts of the allocated area, the existing urban road system and the wider transport network, with highway improvements where necessary.

### **EFFECTS ON POLICIES AND PLANS**

- 17.88 The route corridor would support local transport policies outlined in the Kettering and Wellingborough Local Plan which support the A509 Isham Bypass. The provision of a bypass would contribute to improving county and local environmental and cultural heritage objectives in the village centre of Isham which is designated as a Conservation Area. This would improve the overall amenity of the village, by reducing the severance currently experienced in this area. There could be some conflict with local planning policy which seeks to protect the setting of Conservation Areas as it could slightly affect the setting of Pytchley and to a greater degree, the setting of Great Harrowden Hall.
- 17.89 The majority of the study area comprises Grades 2 and 3a agricultural land. The route would conflict with national, regional and local planning policies which seek to protect the best and most versatile agricultural land from inappropriate development.
- 17.90 The route would conflict with national, county and local planning policies which seek to protect the open countryside from inappropriate development. The national and community need for the Isham Bypass in order to meet transport objectives could be seen as an overriding reason for permitting highway development within the open countryside.
- 17.91 The route would cross several public rights of way and would be subject to county and local planning policy which seek to ensure that development positively integrates existing public rights of way or propose appropriate diversions.

### **SUMMARY**

- 17.92 The proposed bypass would facilitate regional and local transport planning objectives which support improvements to the existing A509. The impact of the route on land use policies is balanced.
- 17.93 With mitigation measures in place, the extent to which the Scheme conflicts with certain planning policy objectives could be reduced. This applies particularly to archaeological and biodiversity mitigation and appropriate landscape mitigation proposals to reduce the impact of the Scheme on the open countryside.

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## 18. CUMULATIVE IMPACTS

### INTRODUCTION

18.1 This chapter outlines for the scheme, its cumulative effect on the range of environmental topics, within each of the following locations:

- ◆ Isham;
- ◆ Hill Top;
- ◆ Little Harrowden;

### ISHAM

18.2 The Scheme would significantly reduce the amount of traffic traversing Isham. This would reduce community severance and improve the overall local amenity. It would provide a user-friendly environment for pedestrians and cyclists, thereby improving the existing village centre which is a designated conservation area. Noise and air quality would improve in much of Isham. The Scheme would traverse four public rights of way, two of which directly link into the village of Isham and some disruption may be expected mainly during the construction phase. The Scheme would increase the level of noise currently experienced by some residents located on the western boundary of the village and impact on their views. However, it is located in cutting at this point to minimise the deterioration in the noise environment and reduce visual intrusion. Overall, the cumulative impact of the Scheme on Isham is expected to be beneficial.

### HILL TOP

18.3 The Scheme would reduce the amount of traffic traversing Hill Top, improving the amenity of the area. The proposed roundabout and associated lighting on the northern edge of Hill Top road would result in an adverse night-time impact. The Scheme would result in a substantial visual impact for some residents of Hill Top road. It would directly impact cultural heritage resources located north of the B574 Hill Top road. The Scheme is located in cutting to the west of Isham and at Hill Top, which would reduce noise levels for local residents. The cumulative impact of the Scheme on Hill Top is expected to be slight to moderate adverse.

### LITTLE HARROWDEN

18.4 The Scheme would not impact on noise and air quality in Little Harrowden, which lies some distance from the Scheme. Provision for vehicular and pedestrian traffic travelling between Little Harrowden and Hill Top will be maintained. It would have an adverse impact on the local landscape and views from Little Harrowden. Overall, the cumulative impact of the Scheme on Little Harrowden is expected to be neutral.

## **OTHER SCHEMES**

- 18.5 There are no other significant developments in the Isham area with which the Scheme would interact to generate additional, cumulative environmental impacts. Should a decision be taken to promote the improvement of the A509 between Isham (Hill Top) and Wellingborough, the cumulative impacts associated with the developments of two link road proposals will be reported in the Environmental Statement for that scheme.

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## 19. IMPACTS DURING CONSTRUCTION

### INTRODUCTION

- 19.1 This section identifies the possible disruption due to the temporary construction activities associated with a new road scheme. A broad assessment has been undertaken in terms of proximity to and the likely effects on people and property, including vehicle travellers, pedestrians and cyclists, ecological resources and landscape and cultural heritage.
- 19.2 Temporary, short-term effects may relate to traffic management and changes in traffic regime, temporary land-take for construction site compounds, the disposal of spoil and the importation of materials, emissions of dust, construction noise and vibration, control of pollution to the water environment, ecological considerations and the impact on the local community. The construction impacts would be temporary in nature
- 19.3 Adverse environmental impacts would be partially limited by the controls on activity incorporated into standard contract practice and environmental health standards. These would include provisions to minimise the effects of construction noise, temporary diversions, works access and working hours. Routes to the construction site would be discussed and agreed with the Highways Agency and the local highway authority.

### GENERAL CONSTRUCTION ACTIVITIES

- 19.4 The potential main sources of disruption due to construction of a scheme would include the following:

#### Overview and procurement strategy

- 19.5 The construction programme will be dependant on the progress of statutory procedures and the chosen method of procuring the construction of the works themselves.
- 19.6 It is also possible that the overall construction programme could be affected by carrying out an advanced earthworks contract. By carrying out some advanced earthworks settlement would take place before the road construction and the long-term effects of settlement could be reduced.
- 19.7 Other types of possible advance works that could affect the programme are:
- ◆ Landscape planting
  - ◆ Diversion of Statutory Undertakers plant.

#### Construction Method and Overall Sequence of Work

- 19.8 The construction of the works is likely to follow the established sequence of:
- ◆ Establishment of offices and compounds;
  - ◆ Fencing and site clearance;
  - ◆ Earthworks and drainage;
  - ◆ Road pavement construction;
  - ◆ Safety fencing and street lighting;
  - ◆ Road markings and road signs;
  - ◆ Landscape Planting.

19.9 Within the above sequence, the following operations would also have to be completed:

- ◆ Statutory Undertakers diversions and supplies;
- ◆ Accommodation works and access tracks;
- ◆ Construction of structures;
- ◆ Works to watercourses;
- ◆ Environmental mitigation measures.

#### **Temporary Site Offices and Compound**

19.10 The contractor would be required to establish temporary offices, compounds and storage facilities adjacent to the site. Locations for these compounds have not yet been determined. The contractor would liaise direct with landowners over arrangements for these facilities, but would be obliged to comply with local authority planning restrictions over location, access arrangements and screening. The site offices and compound would be likely to be enclosed by security fencing and might be lit.

#### **Noise Levels and Working Hours**

19.11 The maximum permitted noise levels from construction activities would be agreed with the local authorities following discussions with their Environmental Health Officer, and would be included in the contract documents. Normal working hours are likely to be 7am to 6pm Mondays to Fridays and 8am to 5pm Saturdays with work outside these hours to be subject to agreement with the relevant local authority.

#### **Service diversions**

19.12 The Bypass construction would require changes to be made to utility equipment either by making permanent diversions or by moving the equipment to avoid the construction work. These changes would be made as part of the contract works. During this process, a service supply may be disrupted for a short time between disconnecting the old supply and connecting to the new. This is often the case with modifications to a water supply network. Specific details would not be available until the detailed design stage, but any interruptions in a service supply would be kept to a minimum.

#### **Temporary Traffic Management, Prohibited Routes and Site Access**

19.13 Overall the construction of the works themselves would cause minimal disruption to existing traffic as the majority of the roadworks and other works are off-line. However, the construction of tie-ins with the existing road network and the Orlingbury Road bridge would require the imposition of temporary traffic management measures. These will involve the use of single way working under temporary traffic signals, possibly limited to off-peak times. Traffic management measures would have the greatest impact on the A509 traffic and detailed measures would be agreed with the appropriate highway authorities.

19.14 There is no opportunity for the delivery or disposal of any materials to site other than by road and certain routes would be prohibited from use by the contractors' vehicles to prevent adverse effects on local residents.

- 19.15 The contractor would be obliged to maintain access for all frontagers affected by the works, including agricultural access to fields and enclosures, at all times. Where accesses are to be stopped up under the Scheme's Side Road Order (SRO), alternative means of access would be provided in accordance with the requirements of the Order. It is usually advantageous for the contractor to provide the alternative means of access as soon as possible after the commencement of the works, thus providing greater flexibility over the programming and completion of the roadworks themselves.
- 19.16 As well as delays to road traffic, it may be necessary to temporarily divert or close footpaths to allow safe construction of the Bypass.

#### **Fencing and Site Clearance**

- 19.17 Fencing would be likely to be restricted to accommodation works and site safety fencing. The construction of these works would be unlikely to have any notable impact on the surrounding area.
- 19.18 Site clearance work should not involve the significant removal of materials from the site, other than limited removal of vegetation and trees.
- 19.19 The contractor would not be permitted to burn materials on the site as a means of disposal.

#### **Earthworks and Drainage**

- 19.20 Delivery, haulage, excavation and deposition of materials would involve the use of heavy construction plant for a period of several months, principally during the summer when the weather conditions are advantageous for this kind of work. Currently, there are no identified suitable sources of materials immediately adjacent to the site and therefore no new borrow pits are anticipated along the line of the new road.
- 19.21 Local granular materials would be used for the earthwork fill which would be brought to the site in large tipper lorries. The construction of cuttings would result in the excavation and disposal of unsuitable material off site. The haulage associated with this work would be combined with the delivery of import fill material and therefore, there would be an overall reduction in lorry movements.
- 19.22 The amount of construction traffic generated by the removal of excess soil is dependent on the location of tipping facilities and the contractor may propose local tipping arrangements, which would be the subject to the statutory planning process.

#### **Road Pavement Construction**

- 19.23 The construction of the road pavement would result in significant quantities of granular and bituminous/cementitious materials being delivered to the site in large tipper lorries. Local suppliers are not likely to be available for all these materials and some long distance traffic would be needed to supply them.
- 19.24 Pavement construction methods would involve the use of vehicles to spread and compact materials in layers to the required overall thicknesses.
- 19.25 Until the contractor has been appointed and the Scheme designed in detail, it is not possible to calculate the types and quantities of materials which may be involved. The numbers to be employed on the construction project are also dependent on the contractors' selected methods of construction.

## KEY CONSTRUCTION IMPACTS

19.26 The key impacts associated with the bypass during the construction phase are detailed in the following paragraphs.

### Watercourses

19.27 The Scheme would cross Pytchley Brook and Hardwick Brook. Any work that affects the flow of a watercourse, such as culverting, will require a Land Drainage Consent from the Environment Agency. A Temporary Works Consent may be required where construction involves the blockage of a channel.

19.28 With any construction work undertaken close to a watercourse there is an inherent risk of surface water and groundwater contamination. Potential contaminants include fuel oils from mechanical plant, dirty water runoff from the site, cement, site disturbance within the river channel and general debris from the construction site.

19.29 The deliberate or accidental discharge of polluting material into controlled waters is an offence under the Water Resource Act 1991 if undertaken without consent and could lead to major adverse impacts without mitigation.

19.30 The risk of pollution can be significantly reduced by the adoption of good working practices and strict adherence to the Environment Agency's Pollution Prevention Guidelines. The relevant guidelines are listed below:

- ◆ PPG 1 General Guide to the Prevention of Water Pollution
- ◆ PPG 5 Work in, near or liable to Affect a Watercourse
- ◆ PPG 6 Working at Demolition and Construction Sites
- ◆ Guidelines on silt pollution and how to avoid it

19.31 Further mitigation measures should include:

- ◆ On-site availability of oil spill clean up equipment including absorbent material and inflatable booms for use in the event of an oil spill or leak
- ◆ Use of drip trays under mobile plant

19.32 Any material imported for use in construction should be inert and free from contaminated material, so as to avoid any potential contamination of the watercourse.

19.33 Provided correct working procedures and practices are adopted, as outline above, and care is taken to avoid pollution, no adverse impacts are anticipated during construction.

### Traffic

19.34 The construction work and the movement of heavy plant in the vicinity of the bypass would result in disruption to local traffic. Discussions will be held with the local highway authority to establish the phasing of the works and to discuss where potential closures and diversions would be most practical in order to minimise disruption and at the same time facilitate the work progress.

### Properties

19.35 Nuisance such as noise, dust and dirt can be expected to affect those properties close to the proposed routes generally within 100m of the works. Such adverse effects will be minimised by requiring the contractor to employ good working practices which adequately control these nuisances.

### Local Wildlife

19.36 Vegetation for removal will be cleared outside the breeding season to avoid disturbance. Where clearance is needed in the breeding season, surveys by an ecologist will be carried out prior to clearance. There will be general noise disturbance and visual disturbance to wildlife from construction activity as well as potential disturbance to badgers, bats present within the Isham study area. Although the lighting of parts of the scheme during construction will be limited to that necessary for safe working, the lighting may have an adverse impact on birds and insects. All potential impacts on local ecology will be minimised by good site management practice.

### Agriculture

19.37 Holdings which would be affected by the Scheme may suffer the adverse effects of dust and dirt during construction. The contractor however, will be obliged to keep dust and dirt to a minimum by employing appropriate working practices. Access to the farm holdings will be maintained at all times during construction. Any disruption of field drains by road construction will be rectified by the scheme's drainage system.

### Archaeology

19.38 Any ground disturbance has the potential to reveal archaeological remains. The likelihood of this is discussed in Chapter 11. A programme of archaeological monitoring during groundworks will form part of a strategy to record the location and nature of archaeological remains that are encountered.

### Dust/Emissions

19.39 Air quality can be affected by dust-raising activities during construction and by emissions from construction vehicles, both on site and travelling to and from the site. Dust emissions can also lead to increased concentrations in the air, both for total particulate loading and for the smaller fraction, PM<sub>10</sub>.

19.40 Dust emissions can lead to increased deposition rates in the surrounding area which can cause soiling of cars, windows, washing etc. and so would be a nuisance.

19.41 Mitigation measures to control dust during construction would typically be specified during contract documentation. Such measures would include:

- ◆ Regular water-spraying and sweeping of roads to minimise dust and remove mud and debris;
- ◆ Using wheel washes for all vehicles leaving the site;
- ◆ Sheeting vehicles carrying dusty materials to prevent materials being blown from the vehicles whilst travelling;
- ◆ Enforcing speed limits for vehicles on unmade surfaces;
- ◆ Dampening down of surfaces prior to them being worked;
- ◆ Storing dusty materials away from site boundaries.

19.42 There is limited scope for gaseous emissions from plant and construction traffic affecting adjacent residential areas. This can be minimised by ensuring that such equipment only operates as required i.e. is not allowed to idle for long periods. Where static plant is involved this should be located as far as practicable from sensitive properties.

## Noise

- 19.43 Construction of the scheme will inevitably create construction noise resulting from the movement and operation of plant on the site relating to earthworks. The level experienced depends on the source and the distance to the listener, together with additional factors such as intervening obstacles and the level of ambient, background noise. The disturbance caused by construction noise in turn depends on the duration and frequency of the noise. Higher noise levels tend to be tolerable for intermittent noise as opposed to a continuous sound. Mostly, construction noise would result from the movement and operation of plant on the site, and will be low level and intermittent.
- 19.44 Levels of acceptable noise and working hours would need to be agreed with the Borough Council of Wellingborough and Kettering Borough Council prior to the commencement of works.
- 19.45 Vibration from construction works is potentially more noticeable although at the distances involved, it is unlikely to be a material consideration in terms of either human perception or building damage.

## Visual Impact

- 19.46 The construction of a bypass at Isham is likely to have significant adverse impacts on the landscape for properties close to the route, particularly where existing vegetation is temporarily removed and for those in close proximity to the contractor's compound. Site vehicles will be very evident as they move along constructing the proposed route.

## MITIGATION

- 19.47 It is anticipated that a range of mitigation measures, including those referred to above, will be incorporated in a construction environmental management plan. This will form part of the contract documents and will ensure that the methods of working will comply with environmental best practice for construction projects.

## SUMMARY

- 19.48 This chapter has outlined the main environmental impacts during the construction of a bypass at Isham. The impacts would be temporary in nature and with mitigation measures in place, adverse impacts during construction should be limited. The key consideration during the road construction would be the timing of the clearance works and major construction activities. Noise control measures will be agreed with the local authority to ensure construction noise is minimised; stringent measures will be taken to protect the ecology and the drainage system of the area during the construction phase; construction traffic will be restricted to main roads and within the site boundary and dust and dirt nuisances will be kept to a minimum by employing appropriate working practices.

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## 20. CONCLUSIONS

### INTRODUCTION

20.1 The conclusions of the assessment of the Scheme are presented in the Appraisal Summary Table 20.1. The principal environmental issues associated with the Scheme and the mitigation measures which should be employed to further reduce identified impacts are summarised below.

### KEY ENVIRONMENTAL IMPACTS

- 20.2 The existing A509 carries approximately 21,300 vehicles per day. The design capacity of the route is approximately 13,000 vehicles per day. It is apparent that high levels of traffic run through Isham adversely impacting on the local natural, built and human environment.
- 20.3 The proposed bypass would relieve Isham of high volumes of through traffic, which would enable the village to be returned to its residents. It would improve the noise environment and local air quality for local residents, generally promoting a quieter ambience within the area and instilling a rural nature within the area. The Scheme would increase noise levels for those dwellings located on the western edge of Isham, but this would be mitigated by locating the road in cutting at this point.
- 20.4 The Scheme would have a large adverse impact on the local landscape, necessitating cuttings to a depth of 9m and embankments which would rise to 10m. However, the Scheme would have a positive impact on the townscape of Isham. The reduction in through traffic would enable the historic character to be more fully appreciated.
- 20.5 The Scheme would not directly impact any local regional or national sites of ecological importance. It would indirectly impact on one County Wildlife Site by reducing the value of interconnecting hedgerows and a range of local habitats. Mitigation measures are proposed where protected species may be affected. Additional survey prior to construction will further inform ecological mitigation design.
- 20.6 There will be no adverse impact on Scheduled Ancient Monuments, Listed Buildings or Historic Parks and Gardens. There may be some impact on areas of archaeological potential. Isham Conservation Area and a number of Listed Buildings would benefit from traffic relief.
- 20.7 Water quality in the area is assessed as being of good quality. The water environment is important in terms of the water quality, local riverside amenity and the aesthetics. Overall, the impact of the Scheme is expected to be negligible on most attributes.
- 20.8 The proposal would have a positive effect on physical fitness and journey ambience. The environment would improve for local residents, whilst the Scheme would improve journey reliability and safety for long-distance and commuter traffic.

Table 20.1: Appraisal Summary Table: Isham Bypass

Option: A509 Isham Bypass	Description: The Scheme would pass to the west of Isham from the A14 Pytchley roundabouts running southwards to rejoin the A509 Wellingborough Road midway between Hill Top and Great Harrowden. OSGR: 487660 - 275593 (start), 488228 - 271518 (end)	Problems: The Village of Isham on the A509 between Kettering and Wellingborough currently suffers from the effects of through traffic with approximately 21,300 vehicles, 12% of which are HGVs travelling through the village in 2002.	Present Value Costs to Public accounts £m: £10.314m
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OBJECTIVE	SUB-OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE	ASSESSMENT		
ENVIRONMENT	Noise	Assessed Scenario	Qualitative Impacts			
		RPG	Bypass and Previously Assessed Existing Network	Traffic diverted away from roads within more built-up areas to those passing through more rural environments.	DM = 140 DS = 122	N = -18
			As above AND Additional Existing Network		DM = 377 DS = 337	N = -40
		RSS	Bypass and Previously Assessed Existing Network		DM = 140 DS = 131	N = -9
	As above AND Additional Existing Network		DM = 623 DS = 560		N = -63	
	Local Air Quality (RPG)	There are 3 properties where the PM <sub>10</sub> increases > 1 µg/m <sup>3</sup> at 20m from the road centre There are 7 properties where the NO <sub>2</sub> increases of > 2 µg/m <sup>3</sup> at 20m from the road centre There are no locations where the NO <sub>2</sub> concentration > 40 µg/m <sup>3</sup> at 20m from the road centre	A = 692 B = 107 C = 0	PM <sub>10</sub> AS = -53 NO <sub>2</sub> AS = -166		
	Local Air Quality (RSS)	There are 7 properties where the PM <sub>10</sub> increases > 1 µg/m <sup>3</sup> at 20m from the road centre There are 33 properties where the NO <sub>2</sub> increases of > 2 µg/m <sup>3</sup> at 20m from the road centre There are no locations where the NO <sub>2</sub> concentration > 40 µg/m <sup>3</sup> at 20m from the road centre	A = 358 B = 107 C = 334	PM <sub>10</sub> AS = -29 NO <sub>2</sub> AS = -47		
Greenhouse Gases (RPG)	Would lead to an increase in emissions of greenhouse gases.	Not applicable	T = 3837			
Greenhouse Gases (RSS)	Would lead to an increase in emissions of greenhouse gases.	Not applicable	T = 5295			

OBJECTIVE	SUB-OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE	ASSESSMENT
	Landscape	Runs through open countryside of hilly terrain consisting mainly of arable and pasture land with some small areas of woodland. This route goes against the grain of the topography cutting across two valleys with embankments up to 10 metres in height.	Not applicable	Large adverse
	Townscape	Positive benefits to the townscape of Isham but the context of Pytchley could suffer slightly as there are likely to be views of the route from the eastern outskirts of the village.	Not applicable	Moderate Beneficial
	Heritage of Historic Resources	Direct impacts on buried remains of local/regional importance. Ongoing surveys will confirm the extent of survival. Further investigations/ recording should minimise impact on, and enhance understanding of, the resource	Not applicable	Slight to moderate adverse pending evaluation
	Biodiversity	A slight adverse impact on a CWS and cumulative slight to adverse impacts on habitats of a lower ecological value suggest that the overall impact would be moderate adverse. Impacts on protected species cannot be assessed until further survey has been undertaken to provide an appropriate level of information and this may change the overall assessment.	Not applicable	Moderate adverse
	Water Environment	The water environment is important in terms of the water quality, two SSSIs, local riverside amenity and the aesthetics. The impact of the road is expected to be insignificant on most attributes, with impacts of low significance on conveyancing of material in flows and amenity issues.	Not applicable	Slight Adverse
	Physical Fitness	Due to the speed and volume of traffic on the bypass, the Scheme would not promote cycling and walking on the route. However, conditions for cyclists and pedestrians in the village of Isham would improve once traffic is reduced. Minor diversion of some rights of way.	Not applicable	Beneficial

OBJECTIVE	SUB-OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE	ASSESSMENT
	Journey Ambience	The provision of a high quality road; the reduced potential for accidents and reduction in traveller stress would contribute to enhancing the quality of the journey for the travellers. However, all routes would commence from the A14 Pytchley roundabout and therefore there could be potential for an increase in traveller stress at this junction.	Not applicable	Beneficial
	Accidents	Local concern over the number of accidents at Hill Top and Great Harrowden crossroads. Current position of terminating junction (southern end) does nothing to address this problem.	Accident Savings: High 122: Fatal 4, Serious 23, Slight 157 Low 124: Fatal 4. Serious 23, Slight 161	PVB (high) £46.7m PVB (low) £46.1m
	Security	Not applicable	-	-
	Transport Economic Efficiency	It is likely to provide traffic relief to Isham, but could have a detrimental effect on Hill Top and Great Harrowden crossroads if remedial measures are not included as part of the scheme.	For opening year 2007: Peak journey time change 1.4 (mins): pending Off peak journey time change 0.9 (mins): pending	NPV (high growth) £36.5m NPV (low growth) £35.8m
	Reliability	Journey times are likely to be consistent between A14 and Great Harrowden.	-	Not applicable
	Wider Economic Impacts	Not Applicable	-	-
	Option values	Not applicable	-	-
	Severance	Severance of Isham village would be greatly reduced. Would result in severance to eight agricultural holdings, only two would be affected to more than a minor degree. One footbridge and diversion required for some public rights of way.	Not applicable	Moderate Beneficial

OBJECTIVE	SUB-OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE	ASSESSMENT
	Access to the Transport System	There is unlikely to be any significant change	-	Not applicable
	Transport Interchange	Not applicable	-	-
	Land-Use Policy	The Scheme complies with local transport planning policy which refers to the provision of a bypass at Isham. Conflict with landscape and nature conservation policies which seek to protect open countryside from inappropriate development and minimise against loss and severance to habitats.	Not applicable	Neutral
	Other Government Policies	No specific conflict with other national policy objectives identified.	Not applicable	Neutral

A = Total number of properties within 200m of roads where air quality improved

B = Total number of properties within 200m of roads where air quality worsened

C = Total number of properties within 200m of roads where there is no change in air quality

PM<sub>10</sub>AS = PM<sub>10</sub> overall assessment score (negative = improvement)

NO<sub>2</sub>AS = NO<sub>2</sub> overall assessment score (negative = improvement)

N = net difference in estimated population annoyed by noise (negative = improvement)

DM = number of people annoyed by noise with DM

DS = number of people annoyed by noise with DS

T = total change in CO<sub>2</sub> emissions in tonnes/year from DM 2009 (negative = improvement)

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