Managing and mitigating the effects of expansion

In the following section, we identify some of the key impacts that expanding an airport can have, and how we are proposing to manage and mitigate them. Local and regional environmental and social sensitivities have been a key consideration in the development of our proposals.

We have gathered extensive environmental information and are in the process of identifying likely significant environmental effects. We are developing measures to avoid, reduce, or mitigate any adverse impacts and also proposing opportunities to provide environmental enhancements. This process is known as an Environmental Impact Assessment (EIA). The full results of the EIA will be presented in an Environmental Statement, which will be submitted with our application for development consent. Our findings to date are set out within the **Preliminary Environmental Information Report (PEIR)**.

The purpose of the PEIR is to provide preliminary information on the likely significant environmental effects of the development, so people can make informed responses to our consultation. The EIA process, as reported so far within the PEIR, involves identifying potential 'receptors or resources' (including people, historical buildings, community facilities, businesses and the natural environment) that could be affected by aspects of the scheme, and their sensitivity to change.

The EIA identifies measures to avoid or reduce negative impacts, and these are known as mitigation measures. The EIA then assesses the effectiveness of these measures and identifies the extent of impacts with these measures put in place. Impacts are identified as adverse (i.e. negative) or beneficial (i.e. positive) and classified into 'significant' and 'not significant' effects on the basis of the predicted magnitude of impact and the sensitivity of receptors.

PEIR

This is the document in which we describe our assessments of all environmental effects that our development could cause, and how we propose to manage and mitigate them, so that people can provide informed responses to our consultation. You can read the full report on our website or at our document inspection venues. This section of the consultation brochure provides a summary of each issue.

Each subsequent section states where likely significant and not significant effects have been identified in the EIA, as reported within the PEIR, taking into account any proposed mitigation measures.

Agricultural land quality and farm holdings

Aspects of our proposals that could cause effects

The scheme would use agricultural land to the east of the existing airport. This land is owned by us and some of this land is currently being farmed by a single farming business under a tenancy agreement.

Approximately half of the agricultural land to be built on is classified as Best and Most Versatile agricultural land, which is of high value for agricultural use. Therefore, the scheme would inevitably result in the loss of this agricultural land resource, which is considered to be a significant effect.

Measures for reducing potential effects

We propose to manage the agricultural land under a new agricultural tenancy which will retain some areas in agricultural use during Phase 1. All land would be taken out of arable production during Phase 2 to provide new areas of habitat creation. However, the neutral grassland provided as biodiversity mitigation is potentially reversible, i.e. the grassland could be returned to its former agricultural use by future generations, if required. Furthermore, we will develop a Soil Management Plan to reuse topsoil and subsoil from the site within the design of our development, where feasible (an outline version of this plan is included within **Appendix 6.6 in Volume 3 of the PEIR**). By doing this, we will seek to minimise effects on the soil resource.

Chapter 6 of the PEIR provides further information on the likely effects associated with agricultural land quality and farm holdings.

Air quality

Aspects of our proposals that could cause effects

We have assessed the extent to which the scheme could impact on air quality due to emissions from construction traffic, dust from construction and demolition works. Once operational, we have considered the extent of increased emissions due to increased staff and passenger journeys to and from the airport on the road network, aircraft engines and vehicles operating at the airport, and other airport activities, such as fire training and engine testing.

To inform the assessment, we have utilised data from an air quality monitoring station located at the airport that is measuring a range of potential pollutants wider than that monitored by any other major airport in the UK. In addition to monitoring nitrogen dioxide (NO_2) and particulates, we are also monitoring sulphur dioxide, carbon monoxide, ozone, black carbon and volatile organic compounds, such as benzene, naphthalene and toluene. All of these pollutants can be harmful to human health depending on the concentration. Air quality monitoring data from the station is publicly available in near real time on the website: **airqualityengland.co.uk**

Additional monitoring is also being undertaken at the airport and at nearby residential areas, to supplement monitoring carried out by LLAOL, Luton Borough Council and other local authorities.

One of the key air quality issues we are considering is the emission of NO_2 gas. The gas is produced from the combustion of petrol, diesel and aviation fuel. Production of NO_2 by road traffic is a major source of pollution and has led to Air Quality Management Areas being declared in Luton, Hitchin, Dunstable and St Albans. Despite this, monitoring has demonstrated that existing NO_2 concentrations at the locations representative of where people live are below the UK air quality standards set out in legislation. Concentrations monitored close to the airport, in the car parks and on the apron are comparatively higher, but these are away from residential properties and therefore not representative of where people live.

Measures for reducing potential effects

We are committed to minimising emissions from the construction and operation of the expanded airport, as far as practicable.

The Draft CoCP sets out measures to minimise and control emissions during the construction period, including requiring contractors to control and limit dust, air pollution, odour and exhaust emissions during the construction works. The Draft CoCP includes measures such as, but not limited to, the following:

- A Dust Management Plan will be developed and implemented to minimise construction dust from the works, including measures to minimise dust from the operation of construction vehicles, machinery, earthworks, construction activities and trackout;
- Regular monitoring of dust will be undertaken on and off-site throughout the construction works, with cleaning of surfaces to be provided, if required;
- A stakeholder communications plan will be developed and implemented before works commence on site, in order to record and respond to any complaints received with regards to dust or air quality impacts; and
- A Construction Traffic Management Plan and a Construction Workforce Travel Plan will be implemented for the sustainable delivery of goods and materials, and to encourage sustainable travel of the construction workforce to the site. In addition, during Phase 2 the new Airport Access Road incorporated within the scheme will provide road traffic routes away from sensitive receptors for access to the site.

To minimise and manage emissions during operation, a Draft Air Quality Plan has been prepared (refer to **Appendix 7.2 of Volume 3 of the PEIR**). This sets out measures to reduce emissions from:

- Aircraft;
- Airside vehicles;
- Surface access;
- Energy and fixed plant;
- Miscellaneous emissions; and
- Odour emissions.

We are proposing to implement the following measures to tackle aircraft and airport emissions:

- Providing fixed electrical ground power at the stands so aircraft can minimise the use of their auxiliary engines when on the ground.
- Encouraging airlines to use their newest and most efficient aircraft and the take up of sustainable aviation fuels.
- Working with the National Air Traffic Service and airlines to reduce hold times in the air and on the ground.
- Encouraging the operator to update the fleet of ground support equipment that operates on the airport aprons to a low or zero-emission fleet, such as a fleet of electric powered vehicles.
- Introducing binding limits on the airport's air quality impacts as part of our Green Controlled Growth initiative (see page 49 for more detail).

Managing and mitigating the effects of expansion

We are also proposing to make it easier for passengers and airport employees to travel by public transport to and from the airport, with the aim for 45% of passengers travelling to the airport using public transport and other sustainable modes of transport by 2039.

Furthermore, we will encourage the use of low and zero-emission vehicles by providing charging points for electric vehicles to keep pace with the increasing demand by employees and the electric vehicle charging preferences of car driving visitors, taxi companies, and public service vehicles.

In terms of energy use within the airport, reliance on fixed combustion plant will be reduced and zero emissions plant provided, where permissible.

Our preliminary assessment demonstrates that, with mitigation in place as described above, airport expansion would have no significant effect on existing air quality during construction or operation.

The Draft CoCP can be found in Appendix 4.2 of Volume 3 of the PEIR.

Chapter 7 of the PEIR provides further information on the air quality assessment undertaken to date.

Biodiversity

Aspects of our proposals that could cause effects

In addition to the existing airport infrastructure and Wigmore Valley Park, the site includes previously undeveloped land that is either in agricultural use or is being managed as grassland, with hedgerows, trees and shrubs located on field boundaries. Occasional woodland blocks, tree belts, areas of scrub and grassland are also located within and adjacent to the site boundaries.

The area includes three sites locally designated for nature conservation, the Wigmore Park County Wildlife Site, Winch Hill Wood County Wildlife Site and Local Wildlife Site, and Dairyborn Scarp District Wildlife Site. Winch Hill Wood is also designated as ancient woodland. Ecological surveys undertaken to date have demonstrated that the site and the surrounding area is home to a number of protected or notable species, including badgers, bats, brown hares, hedgehogs, slow worms, common toads, common frogs, smooth newts, Roman snails, other invertebrates and a range of birds including barn owls and red kites.

Field surveys have identified populations of orchids at the Wigmore Park County Wildlife Site and other notable plants within the site. Botanical surveys undertaken across the site have confirmed the presence of wildlife habitats such as ancient woodland, broadleaved semi-natural woodland, ancient and veteran trees, species-rich hedgerows, semi-improved neutral grassland and calcareous grassland. Various non-native invasive species have also been identified across the site, including Japanese knotweed, Japanese rose, and cotoneaster species.

We have assessed the extent of direct physical effects from the scheme on biodiversity due to construction on currently undeveloped land, and subsequent loss of foraging, commuting and shelter opportunities for a range of protected and notable species. We have also assessed the potential for indirect effects due to disturbance during construction and operation from impacts such as noise and light spill. For instance, the construction of the scheme would result in the direct loss of approximately 15.38ha (almost 100%) of Wigmore Park County Wildlife Site and approximately 2.18ha (29%) of Dairyborn Scarp District Wildlife Site. Winch Hill Wood County Wildlife Site and Local Wildlife Site and ancient woodland would be retained but may be subject to indirect effects.

Measures for reducing potential effects

Where possible, the scheme is being designed to avoid or reduce adverse effects on valued ecological features and deliver benefits for biodiversity in accordance with policy and best practice.

Overall, the scheme would deliver a minimum of 10% biodiversity net gain through the extensive landscaping and habitat creation proposals incorporated within the scheme and the management of retained and proposed habitat areas. Biodiversity net gain is an approach which aims to leave the natural environment in a measurably better state than it was found. The landscape design for our scheme includes large areas of habitat creation on and off-site to partially mitigate the loss of habitats from construction and contribute to the project's target of achieving a net gain in biodiversity.

Much of the habitat creation will be provided within a large area of replacement open space that will be designed to mitigate for the loss of Wigmore Park County Wildlife Site and its habitats. Existing vegetation, including woodland and hedgerow belts on the boundary of the scheme, will be retained wherever possible and a 15 metre buffer zone maintained around areas of ancient woodland and veteran trees to avoid damage to roots. Orchids will be moved from the Wigmore Park County Wildlife Site to a suitable new site within the large area of replacement open space, with measures taken to protect them from being trampled, and another in the habitat creation area. New habitat features will be provided in the form of deadwood in open areas for insects, and artificial bat roosting and bird nesting boxes on buildings and

Managing and mitigating the effects of expansion

retained trees. Habitat creation measures for barn owls and red kites will be provided at a safe distance from the airport, to avoid increasing the risk of bird strike. Such measures will include the creation of grassland, hedgerows and woodland. Opportunities will also be sought to provide barn owl nesting boxes within the wider landscape at a safe distance from the scheme, and to provide alternative barn owl nesting opportunities to those lost to construction of the expanded airport.

A Landscape and Biodiversity Management Plan is being developed to establish, manage and monitor areas of habitat created (a draft version of this plan is included within **Appendix 8.2 in Volume 3 of the PEIR**). The scheme will use directional lighting to avoid light spill onto retained and adjacent habitats to minimise disturbance of nocturnal species, such as bats and badgers, and also to reduce glare for nearby residential areas. Best practice construction environmental management measures will be implemented to minimise disturbance during construction, as described in the Draft CoCP.

Detailed mitigation strategies will be developed that outline species-specific mitigation measures. Where badger setts or bat roosts would be lost or disturbed by the expanded airport, a Natural England licence would be sought, which is likely to require the provision of replacement artificial badger setts and artificial bat roosts. In addition to these mitigation measures, we are exploring potential enhancement measures, such as the enhancement of species-poor/defunct hedgerows and woodland creation to improve connectivity within the wider landscape.

With mitigation in place, including the provision of replacement habitats and planting, it is considered that significant adverse effects on biodiversity can be avoided.

Chapter 8 of the PEIR provides further information on the likely effects on ecology and biodiversity and the mitigation measures proposed.

Climate change resilience and adaptation

Aspects of our proposals that could cause effects

Climate change is a global risk, and we are all faced with the challenge to cut greenhouse gas emissions and adapt to the changing climate.

We acknowledge that the scheme will result in additional greenhouse gas emissions which would contribute to climate change. Greenhouse gas emissions from the scheme, and measures proposed to reduce emissions, are further discussed on pages 120 to 122 of this brochure.

The airport must also be resilient to the changing climate. We have assessed how vulnerable each element of the scheme is to a range of different climate change variables, such as increased temperatures, and the increased frequency of droughts and extreme weather events, such as storms and periods of intense rainfall. All existing airport infrastructure would be maintained in line with LLAOL's existing and future Climate Change Adaptation Reports. We have also considered whether the environmental effects of the scheme could become worse because of climate change.

Measures for reducing potential effects

To increase the resilience of the scheme to the projected impacts of climate change, we are designing buildings, infrastructure and open spaces that can withstand extreme weather events, including hotter and colder temperatures and storm events, and designing a drainage strategy to account for more intense rainfall events. During construction, contractors would also be required to plan for extreme weather events. With measures embedded within design, and good practice construction management in place, any significant effects from the changing climate can be avoided.

As the design of the scheme evolves, we will continue to review its resilience to climate change and consider any new information that becomes available, such as LLAOL's updated Climate Change Adaptation Report being submitted as part of the UK government's third round of the adaptation reporting. This was not available at the time of the preliminary assessment.

Chapter 9 of the PEIR assesses the vulnerability of the scheme to climate change.

Cultural heritage

Aspects of our proposals that could cause effects

Luton and the surrounding areas show evidence of human occupation since the Palaeolithic era, concentrated in river valleys, uplands areas and around water bodies. The area remained largely in agricultural use until the 20th century, preserving archaeological remains, including Iron Age and Roman settlements. After the First World War, the aviation industry became a driver of change within the area. Some of the pioneering work in aviation technology took place at Luton in the inter-war period. The airport was established in the 1930s and, over the course of its development, several assets of heritage value have been identified in the area, including some related to the airport itself, such as a Second World War pillbox (part of the old airfield battle headquarters) and the London Luton Airport Fire Station. The study area includes a variety of designated and non-designated heritage assets, including one scheduled monument (Someries Castle), two registered parks and gardens, six conservation areas and a number of listed buildings.

We have carried out archaeological evaluation works to the east of the existing airport to better understand the potential for archaeology within the boundary of the scheme. The evaluation confirmed that there is a potential for below ground archaeology to be present. The earliest feature found on the site during the evaluation works included a pit containing Neolithic pottery. A series of interconnecting ditches were also found, marking an enclosure where Iron Age features and a Roman building are located. Aerial photography and previous archaeological monitoring have identified two additional areas of crop marks which may represent another Roman building to the east of Winch Hill Farm. These features indicate that the site was in domestic and agricultural use in the late Iron Age to Roman Age. We are planning to undertake additional archaeological evaluation trenching works to improve our understanding of the potential archaeology to the east of the existing airport.

We have assessed the extent to which the scheme could result in physical impacts on heritage assets during construction, due to ground disturbance and excavation works. Furthermore, we have considered the potential for changes in the setting of heritage assets which could occur due to construction noise and visual intrusion from construction traffic and equipment. During operation, we have assessed the extent to which the airport expansion proposals could impact on heritage assets due to changes in their setting arising from the presence of the scheme.

Our preliminary assessment has identified that there is potential for significant effects on Luton Hoo registered park and garden and the Grade II listed Wandon End House and farmhouse buildings. The construction and operation of the expanded airport is likely to detract from the rural setting of these heritage assets, although disturbance during construction would be temporary. Further significant

effects have been identified due to the potential loss of buried archaeology within the site. In addition, effects on the identified Iron Age and Roman settlement within the site have been avoided through changes to the extent of earthworks required for the scheme.

Measures for reducing potential effects

Although our expansion plans will affect parts of the existing historic environment, we will seek to avoid and minimise adverse effects, where possible. A description of our proposed mitigation strategy is provided within the draft Cultural Heritage Management Plan, included within **Appendix 10.6 of Volume 3 of the PEIR**. We are continuing engagement with statutory stakeholders for the development of our mitigation proposals. This is likely to comprise of a programme of archaeological excavation and recording of buried archaeology within the boundary of the scheme for the preservation by record of potential buried archaeology.

In addition, we have reduced the visual prominence of the scheme through the use of embankments, restoration of historic hedgerows, provision of planting, and by minimising light spill, where possible (please see the landscape and visual impacts section on page 125 of the main consultation brochure for more detail).

Chapter 10 of the PEIR provides further information on the likely significant effects associated with cultural heritage

Opposite: Luton Hoo Grade II* Registered Park and Garden

Economics and employment

Aspects of our proposals that could cause effects

As discussed under the 'Benefits of expansion' section of this brochure, expanding the airport would provide employment opportunities and generate wider economic growth during both construction and operation.

Construction would generate new jobs from direct employment, but also in industries supporting the construction works, such as those supplying construction materials and services. It is estimated that over the construction period a total of approximately 620 full-time equivalent jobs would be directly supported. In addition, approximately 310 full-time equivalent jobs would be supported by indirect and induced employment. As such, it is estimated to bring significant economic benefits to Luton and the surrounding 'Three Counties' of Bedfordshire, Buckinghamshire, and Hertfordshire.

During operation, the scheme would generate jobs to support airport operations, airlines and other companies serving the airport and additional employment in supply chains. It is estimated that the scheme would directly support an additional 4,500 jobs at the airport by the time the airport is handling 32 mppa, up from 10,900 in 2019.

When indirect and induced jobs are considered, the total number of new jobs would be approximately 4,800 in Luton, 6,600 in the counties of Bedfordshire, Buckinghamshire and Hertfordshire, and a total of 12,100 across the UK.

Overall, the scheme is estimated to generate an additional £1.6 billion for the UK economy by the time the airport is handling 32 mppa, compared to if the airport expansion did not come forward, resulting in significant beneficial effects to the economy. The economic effects and the net effects after displacement are explained further in **Chapter 11 of the PEIR**.

Further opportunities

We have developed a **Draft Employment and Training Strategy** in liaison with Luton Borough Council and other stakeholders which proposes actions and initiatives with a vision to create quality careers and make the airport an inclusive and aspirational place to work. These proposals include establishing an employment and skills hub at the airport as a one-stop shop for engagement with local education institutions and training providers, explore the creation of an onsite training centre for construction and operational phases, encouraging hiring of apprentices and trainees through procurement and working together with airport employers, enhancing outreach with local community groups and schools, and facilitating research and innovation related to the future of sustainable aviation and construction.

We will work with existing education bodies and employers in advance of construction to determine future skills requirements and gaps to help develop training programmes. As part of their selection criteria, contractors' ability to deliver social value will be considered – whether the contracts could deliver wider social, economic and environmental benefits. For the operational phase, a similar approach will be undertaken. In addition to what we have set out in the Draft Employment and Training Strategy, we expect that some of the employment growth will be taken up by existing airport employers and a number of these have bespoke training programmes. An employment charter or similar initiative for employers will be developed to work towards a set of agreed objectives that will include a focus on local employment and training initiatives.

In conclusion, the proposed expansion is likely to result in significant beneficial effects on the economy and we are exploring measures to enhance these benefits further, both locally and regionally.

Further information on the assessment of likely significant effects on the economy and employment is provided within Chapter 11 of the PEIR.

Greenhouse gas emissions

Aspects of our proposals that could cause effects

The UK government has announced a target of net-zero carbon emissions by 2050 and launched a consultation on the government's strategy to net zero aviation[4]. The aim of the government strategy is for *"aviation to decarbonise in a way that preserves the benefits of air travel and delivers clean growth of the UK sector by maximising the opportunities that decarbonisation can bring"*. The strategy sets the net zero target for UK domestic aviation by 2040. In line with emerging policy, options to decarbonise airport ground operations will be pursued with the operator as part of the actions to reach net zero carbon. We are committed to achieving net zero carbon airport ground operations by 2040.

4 Department for Transport (2021) Jet zero: our strategy for net zero aviation (Accessed 21 September 2021)

We have assessed the level of greenhouse gas emissions that would be produced by the scheme. Although the main source of greenhouse gases from an expanded airport would be from flights, we have also considered greenhouse gases that would be emitted by construction activities, surface access journeys and airport operations. The section below outlines measures proposed as part of the scheme to reduce greenhouse gas emissions.

Measures for reducing potential effects

In order to minimise the airport's carbon footprint, we will do the following:

- During construction, contractors will be required to use materials with lower carbon footprint, and reduce emissions from waste, energy and water use.
- Any lost vegetation will be offset by the provision of new planting.
- New buildings and infrastructure will be designed to be energy efficient and measures will be incorporated into the design to reduce waste.
- Encourage the use of electric vehicles on the airfield.
- Emissions from airport operations will be reduced using low-carbon energy sources, such as on-site renewable energy generation, and measures to improve the management of waste and water.
- Emissions from aircraft operations on the ground will be reduced through the provision of fixed electrical ground power to standing aircraft, and single/reduced engine taxiing.
- Steps to reduce emissions from aircraft during the landing and take-off (LTO) cycle will be considered as part of the developing operational strategy. For example, single/reduced engine taxiing, electric towing, review/minimise use of auxiliary power units (APU), reduce emissions due to aircraft idling and hold.
- We will encourage the take up of sustainable aviation fuels/newer aircraft through operating policy/strategy.
- Use of public transport by passengers and employees at the airport will be encouraged through improvements to public transport connections, such as Luton DART, coaches and buses, and by limiting new car parking provision, ensuring that the amount of new car parking proposed aligns with the wider surface access strategy.
- Where private cars are used, we will encourage low/zero carbon private transport options e.g. electric vehicles.

Following the application of mitigation measures to reduce the generation of greenhouse gas emissions as far as reasonably practicable, offsetting of residual emissions is proposed to achieve carbon neutrality and to reduce emissions to net zero. As noted earlier in this section, the strategy sets the net zero target for UK domestic aviation by 2040. In line with emerging policy, options to

decarbonise airport ground operations will be pursued with the operator as part of the actions to reach net zero carbon. We are committed to achieving net zero carbon airport ground operations by 2040. The offsetting mechanism or schemes by which this will be achieved are currently under review and will be developed and reported with the application for development consent.

Whilst all greenhouse gas emissions are considered to be significant, the preliminary assessment demonstrates that with mitigation in place, emissions from the scheme are not considered to be so significant that they would impact on the UK's ability to meet its current carbon budgets, which lead the UK to net zero carbon emissions by 2050. Greenhouse gas emissions from the construction and operation of the scheme would represent between 2.3% and 3.7% of the Climate Change Committee carbon-cap for aviation emissions for the periods of 2023-2027 and 2028-2032 respectively, and 0.08% of the government's sixth carbon budget for the period of 2033-2037. We will use the Green Controlled Growth framework to monitor and control the scheme's greenhouse gas emissions, so that the target emissions for the scheme are not exceeded.

Our assessment of greenhouse gas emissions will continue to be updated to consider the latest proposals and the developing government policy on greenhouse gas emissions and net zero aviation.

Chapter 12 of the PEIR provides an assessment of greenhouse gas emissions likely to be produced by the scheme.

Health and community

Aspects of our proposals that could cause effects

We have considered the potential impacts of our proposals on local communities in Luton and the wider area that would be directly or indirectly affected by the construction and operation of the scheme. We have assessed effects on health and wellbeing which could occur as a result of noise, air quality, changes in traffic, light spill, landscape and visual effects but also benefits brought by increased employment opportunities and economic growth. Specifically, we have considered how the local community could be impacted

in relation to issues such as access to open space, recreation and physical activity; access to services; employment and income; housing; neighbourhood quality; aircraft noise; social capital; and perception and uncertainty.

Airport expansion is likely to result in indirect significant beneficial effects with regards to health and wellbeing from opportunities for employment, training and apprenticeships along with local and regional economic growth. However, the preliminary assessment has identified a potential significant adverse effect on mental health due to public concern and uncertainty around the planning and construction of the scheme. In addition, the Prospect House Day Nursery located on Prospect Way would need to be demolished for the construction of the new Airport Access Road, resulting in a potential significant adverse effect due to reduced service provision for childcare facilities.

We have assessed the likely effects of our proposals on the users of community resources within the vicinity of the scheme, including residential properties, schools, churches, leisure, sport and recreational facilities, and the network of public rights of way. During construction, public rights of way crossing the site will require temporary closure and diversion. However, alternative routes would be provided. Part of the existing Wigmore Valley Park will be lost however replacement open space will be provided in advance of any works to the existing park. The replacement open space will result in an overall increase in open space. Furthermore, existing facilities will be enhanced with footpaths being upgraded and new signage provided.

Measures for reducing potential effects

The mitigation measures proposed for noise, air quality, traffic and transport, landscape, and visual effects would also result in the mitigation of effects on the health and wellbeing of the local population and the users of community resources. Discussions are taking place with the Prospect House Day Nursery to find a suitable site for relocation. During construction, the lead contractor will implement a community engagement plan in line with our objective to be a better neighbour.

Chapter 13 of the PEIR provides further information on the health and community assessment.

Landscape and visual impact

Aspects of our proposals that could cause effects

The airport is located to the south east of Luton on an elevated plateau and the land to the north of the airport is predominantly residential.

The land to the west includes a mixture of both industrial and residential uses and the land to the east and south is predominantly rural, with arable fields and woodland. The surrounding landscape is recognised for its local landscape value, has an extensive network of public rights of way and has several features valued for their amenity, heritage or ecological value. The Chilterns Area of Outstanding Natural Beauty (AONB) is located approximately 5km west of the airport. The existing airport is a prominent feature in views from much of the surrounding area and is also visible from long-distance views from the Chilterns AONB.

Our scheme would protect several valued landscape features and introduce extensive areas of new hedgerow, woodland and tree planting. The proposals would also:

- Substantially alter the landform to the east of the airport
- Remove an area of locally protected habitat (Wigmore Valley Park County Wildlife Site)
- Require an area of Wigmore Valley Park to be relocated
- Necessitate existing trees being felled
- Affect local tranquillity, and aesthetic and perceptual qualities of the local landscape
- Introduce built form that may be prominent in views from several locations
- Introduce potential light spill

We have considered the extent to which the scheme would be likely to lead to significant changes in the existing landscape and views. Removal of some elements of the existing landscape and alterations to landform is likely to result in significant adverse effects on the qualities of the existing landscape and the landscape character of the surrounding area. A potential significant adverse effect has also been identified on the Chilterns AONB as a result of the increase in Air Transport Movements (ATMs).

Significant effects due to changes to existing views are likely to occur from Wigmore Valley Park, Raynham Way Recreation Ground and Community Centre, Wigmore Hall , Eaton Green Road, Winch Hill Lane, Darley Hall, and nearby public rights of way. As the proposed planting matures over time, the effects on visual amenity would be reduced and in some cases, the new planting would provide enhanced visual screening.

As part of our proposal, an area of Wigmore Valley Park would be lost and replacement high quality open space of a greater area would be provided south of Darley Road. The relocation of the open space is assessed as having a significant adverse effect during the construction period; the planting within the replacement open space would be at an early stage of establishment and people would be aware of construction works to the south being undertaken during this period. As the landscaping matures, the replacement open space would provide an improvement in the long term.

Measures for reducing potential effects

We have reduced the visual prominence and impact on the landscape from the scheme, where possible, through the following measures:

- The design of the scheme has evolved to avoid excavation on the ridgeline of Winch Hill or in land occupied by a Romano-British building, located within the field immediately to the south east of Wigmore Valley Park.
- The design additionally retains the existing entrance and eastern part of Wigmore Valley Park and integrates it into a new area of Replacement Open Space, to be provided over a larger area to the east of the existing park.
- Extensive planting including hedgerows, woodland, tree planting and wild flower grass seeding is proposed within the Replacement Open Space.
- New buildings will be similar in scale and character to the existing airport buildings. Subtle architectural surface finishes will be used to minimise visual impacts.
- Additional hedgerows with hedgerow trees and woodland are proposed within areas outside the boundary of the scheme to further screen the development and to reinstate historic field patterns previously lost as a result of agricultural practices, thus restoring lost landscape character.
- As much of the existing vegetation will be retained, as possible, including hedgerow and woodland planting, in order to screen the scheme. Furthermore, the design of the proposals would avoid impacting on ancient woodland at Winch Hill Wood and retain mature woodland/hedgerow vegetation at Winch Hill and, in part, on the south east boundary of the existing Wigmore Valley Park.
- Avoiding or reducing obtrusive light and minimising light pollution – we will model the potential light spill and design the lighting strategy to minimise light spill beyond the site boundary through the use of measures such as directional lighting and shielding. A preliminary lighting assessment of the current design proposals has been prepared and is appended to the PEIR (see **Appendix 5.2 in Volume 3 of the PEIR**). Measures to minimise light spill during construction are further described in the Draft CoCP.

- We have prepared a draft Landscape and Biodiversity Management Plan to set out measures for the upkeep of any existing and new planting (**see Appendix 8.2 in Volume 3 of the PEIR**).
- Improvements to Public Rights of Way within the surrounding landscape are also proposed, including upgrades to sections of existing tracks and improved signage.

Chapter 14 of the PEIR provides further information on the landscape and visual impact assessment.

Emergency planning and resilience

We have identified potential risks associated with accidents and natural disasters within the context of the expanded airport and considered how resilient the scheme would be to these risks.

Our preliminary assessment identifies potential risks from major accidents and disasters, and considers measures required to mitigate these risks. We are continuing to engage with local emergency resilience forums, emergency planning managers and emergency services to assess the vulnerability of the expanded airport to major accidents and disasters and to develop measures to improve its resilience. Our assessment of potential risks is ongoing and we are working towards mitigating all risks to be as low as reasonably practicable, with no significant risks remaining.

Refer to Chapter 15 of the PEIR for a description of the major accidents and disasters assessment and a description of the measures adopted to ensure the resilience of the scheme to these events.

Noise and vibration

Aspects of our proposals that could cause effects

We acknowledge that noise is a key environmental concern for nearby communities. Noise associated with the airport is primarily caused by departing and arriving aircraft (referred to as air noise). We are also considering noise produced by aircraft on the ground, for example during taxiing and engine running, and increases in road traffic noise that may arise from the expansion proposals due to the increase in the number of vehicles. In addition, we are considering the potential for likely significant effects due to noise from construction works and traffic and due to ground-borne vibration, for example from piling works. A summary of the preliminary assessment undertaken for each of these issues is provided below.

Air noise

We have assessed the likely significant effects associated with air noise from the expanded airport and undertaken noise modelling to determine the change in noise levels that would be experienced by local communities with or without the scheme coming forward. The assessment has been undertaken on the basis of current flightpaths to present a worst-case scenario, as upcoming changes to flightpaths are likely to introduce improvements with regard to noise exposure. See section 8 of the main consultation brochure for more information about prospective changes to flightpaths.

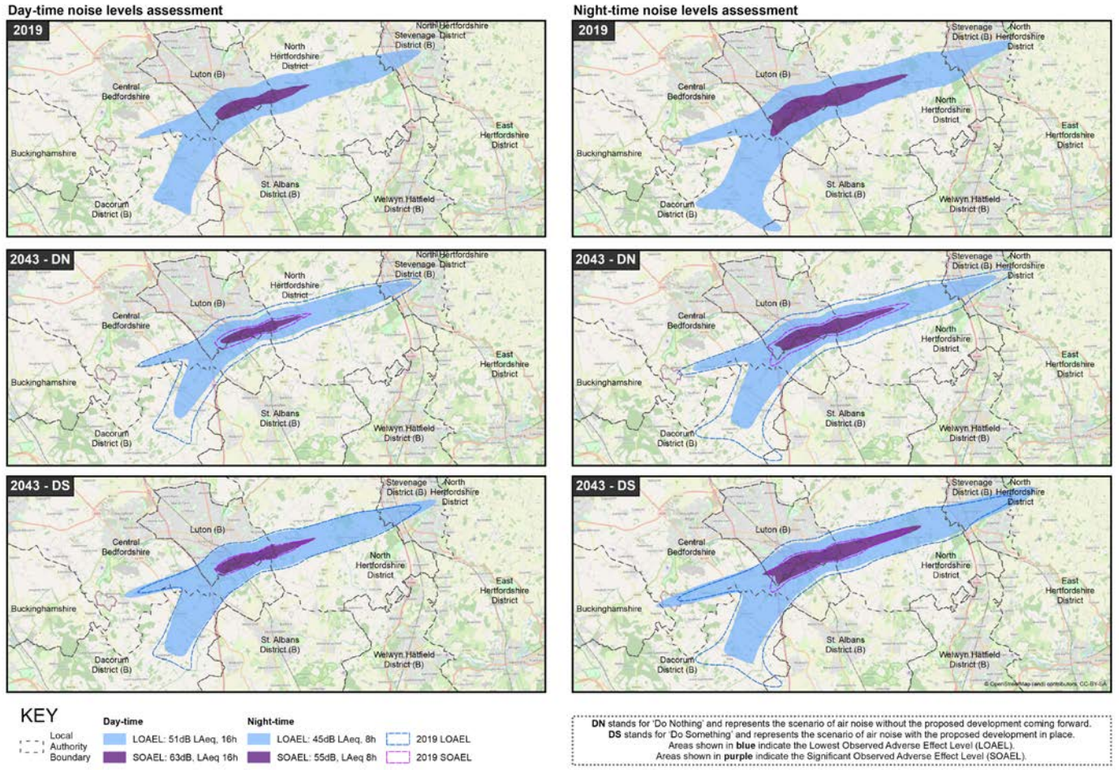
Air noise is assessed by calculating the average noise level over a 16-hour day (from 7:00am to 11:00pm) and 8-hour night (from 11:00pm to 7:00am) for an average day over a 92-day summer period. The average noise level is given in decibels (dB) and presented as noise contours that show the effect of aircraft noise. This averaged decibel measurement 'L_{Aeq}', shown on a noise contour map, is the metric used to define UK aircraft noise and it refers to 'equivalent continuous noise level'.

For the assessment of noise contours, the concepts of Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL) as defined in the Noise Policy Statement for England are used. LOAEL is defined as 'the level above which adverse effects on health and quality of life can be detected'. SOAEL is defined as 'the level above which significant adverse effects on health and quality of life occur'. The threshold for LOAEL for air noise is defined in the UK policy as 51 dB $L_{Aeq,16h}$ for day-time noise and 45 dB $L_{Aeq,8h}$ for night-time noise. The threshold for SOAEL is defined as 63 dB $L_{Aeq,16h}$ for day-time noise and 55 dB $L_{Aeq,8h}$ for night-time noise.

The maps on this page show the modelled noise contours of the airport during day-time and night-time for three scenarios:

- Representing the existing air noise from the airport.
- In 2043 without the proposed expansion works coming forward (i.e. with the airport operating at the current consented capacity but accounting for a reduction in air noise resulting from the ongoing upgrade of aircraft fleet).
- In 2043 with the change in air noise resulting from the proposed expansion.

Figure 6.1 Noise contours



Comparison of the existing air noise modelled for 2019 and the predicted air noise in 2043 shows that overall, even with the proposed expansion, there will be a reduction in the number of people who would experience significant noise effects due to aircraft noise. In total, 600 fewer people will be exposed to noise exceeding the SOAEL threshold during the daytime and 2,300 fewer people during the night-time period, when the modelled noise contours with the proposed expansion in 2043 are compared against the 2019 contours. This is due to quieter and more efficient aircraft that will be phased into the fleet.

If the 2043 noise contours with the scheme are compared against the 2043 noise contours without the scheme coming forward, the difference in air noise experienced by all receptors within the LOAEL and SOAEL areas shown within Figure 6.1 would be between 1 and 3 dB. Overall, it is estimated that in 2043 with the scheme coming forward, 1,100 people will be exposed to significant noise effects during the daytime and 800 people during the night-time period – these would be people residing in the SOAEL areas shown within Figure 6.1.

Households likely to experience significant effects as a result of the difference in air noise are currently eligible for a contribution to insulation under the current noise insulation scheme. Under the draft compensation scheme that would be part of our application for development consent, these properties would qualify for a full sound insulation package for habitable rooms.

Measures for reducing potential effects

The following four principles of mitigating noise impacts established by the International Civil Aviation Organisation[5] have been considered, in the order set out below:

- Reduction of noise at source – relating to improvements in aircraft technology to reduce aircraft noise.
- Use of land use planning and management – preventing new noise-sensitive development in areas affected by adverse levels of aircraft noise.
- Noise abatement operational procedures – such as continuous descents, continuous climb operations and optimal deployment of landing gear which can help reduce aircraft noise.
- Operating restrictions – limits on aircraft movements during specific periods.

There are a range of measures already in place that address the noise impact of the airport, including the London Luton Airport Noise Action Plan (LLNAP) 2019-2023[6]. These measures include operational procedures such as continuous aircraft descents and climbs, operational limits and a noise insulation scheme. Further information on what the airport is currently doing to monitor, control and manage aircraft noise can be found at: **www.london-luton.co.uk/corporate/community/noise**

5 International Civil Aviation Organization (2001), Assembly Resolutions in Force. https://www.icao.int/environmental-protection/pages/noise.aspx

6 https://www.london-luton.co.uk/LondonLuton/files/b5/b53019bb-a021-43c1-bf07-620048371966.pdf

The airport currently operates under the following conditions that were set against the consented capacity of 18 mppa:

- An area limit of 19.4 km^2 for the day-time 57 dB $L_{Aeq,16h}$ noise contour
- An area limit of 37.2 km^2 for the night-time 48 dB $L_{Aeq,8h}$ noise contour
- A maximum of 9,650 movements during the night quota period (11:30pm to 6:00am) for a rolling 12-month period
- A maximum of 7,000 movements between 6:00am and 7:00am for a rolling 12-month period

We will also define noise limits and controls within which the airport would be allowed to operate as part of a Noise Envelope. For example, we are proposing to maintain the existing restrictions of 9,650 aircraft movements during the night quota period (from 11:30pm to 6:00am) to limit night-time aircraft noise levels.

A 'Noise Envelope' is a framework of legally binding and enforceable limits and controls to manage air noise. The government's Aviation Policy Framework and the Airports National Policy Statement promote the concept of establishing a Noise Envelope for the operation of airports, as a means of giving certainty to local communities about the amount of noise which can be expected in the future and to give airport operators certainty on how they can use their airports. The government expects that within the limits set by the Noise Envelope, the benefits of future technological improvements should be shared between the airport and its local communities to achieve a balance between growth and noise reduction.

A Noise Envelope will be established for the scheme through the Green Controlled Growth framework. The type and nature of the controls that will apply within the Noise Envelope would be influenced by the Noise Envelope Design Group (NEDG). The NEDG is independently chaired, and includes representatives from local authorities, the community and other stakeholders with the necessary technical expertise. It provides a means to engage in discussions on defining the Noise Envelope and reaching an agreement among stakeholders regarding its implementation. The NEDG has recommended how it expects noise controls to work for the proposed expansion and how they would be enforced. The implementation of the Noise Envelope would be secured through the DCO process.

Households likely to experience significant effects as a result of an increase in air noise may be eligible for noise insulation, subject to meeting the qualifying criteria. We will be substantially improving noise compensation proposals, should the DCO be granted, compared to the existing arrangements. We are proposing to offer a new tiered noise insulation scheme as part of our expansion plans. The schemes offer a range of packages for homeowners, dependent on the noise effects at their properties. They range from a full package of noise insulation to a financial contribution towards noise insulation, and are among the best offered

by any airport in the UK. Further details can be found in our **Draft Compensation Policies and Measures** document.

Low-cost airlines are expected to continue to dominate air traffic at the airport and these airlines typically replace their aircraft every eight to 14 years. We will continue to encourage our airline operators to upgrade their fleet from existing generation narrow body aircraft to newer generation aircraft, which are quieter and more efficient. The Airbus A320 NEO family of aircraft has already started to be introduced to the aircraft fleet at the airport. Similarly, cargo carriers will move to progressively quieter aircraft types over time. For example, we expect the Boeing-757 aircraft could be replaced by newer Boeing-737 aircraft, while the old and noisy Airbus A300 freighters could be replaced by quieter aircraft such as the Airbus A330 freighters, as increasingly operated by equivalent airlines.

We are also considering the extent to which the next generation of aircraft, including electric and hydrogen powered aircraft, could serve to further reduce noise levels over the longer term.

Separate to our proposals, noise improvements are likely to occur as a result of Civil Aviation Authority's Airspace Modernisation Strategy which sets out the initiatives that the UK industry will deliver to achieve the government's policies of quicker, cleaner, quieter journeys. This may allow for aircraft to climb more quickly due to the lifting of constraints imposed on aircraft from neighbouring airports. As part of this, adjustments to take flightpaths away from the population and to provide respite are also being assessed. See section 8 of this brochure for more information about changes to flightpaths.

Aircraft ground noise

Our development proposals have been designed to reduce aircraft ground noise by providing additional taxiways and improving the use of airfield layout to reduce aircraft taxi time and queueing. The engine ground running bay for engine testing would be relocated within a specially-designed facility with acoustic screening. As we continue to develop our proposals, we are reviewing further locations for acoustic barriers to reduce the impact of aircraft ground noise.

Our preliminary assessment demonstrates that due to aircraft ground noise, residential properties adjacent to the airport would either experience a minor change in noise levels depending on their location in relation to the airport layout. However, these changes in noise levels are not likely to be significant.

Road traffic noise

Increases in road traffic generated by the airport expansion have the potential to result in an increase in noise levels. Potential significant adverse effects are possible for properties in the vicinity of Tea Green and Cockernhoe as a result of increased traffic on Stony Lane and Chalk Hill although absolute road traffic noise levels are expected to remain relatively low. Further modelling

and assessment of these effects will be undertaken to develop appropriate mitigation. Elsewhere across the local area, road traffic increases are expected on most major routes but not to the extent that they would result in significant adverse effects in terms of road traffic noise during construction or operation.

Construction noise and vibration

Our Draft CoCP, in **Appendix 4.2 of Volume 3 of the PEIR**, sets out management measures which will be adopted by contractors to minimise and mitigate noise and vibration during construction. For example, to reduce construction noise and vibration, quieter machinery and equipment will be used, and construction methods which are not inherently noisy will be adopted wherever practical.

With mitigation in place, and because of the distance between the scheme and sensitive receptors, construction noise and vibration effects are not likely to be significant.

Operational vibration

Given the distance of residential properties from both the Luton DART that would be extended to Terminal 2, and also areas where aircraft would operate on the ground, no likely significant effects associated with vibration have been identified during the operation of the expanded airport.

For further information on the assessment and mitigation of noise and vibration effects, please see Chapter 16 of the PEIR and Draft CoCP in Appendix 4.2 of Volume 3 of the PEIR.

Soils and geology

Aspects of our proposals that could cause effects

The geology of the site comprises man-made ground, Head deposits, Glaciofluvial deposits and Clay with Flints overlying chalk bedrock. The Wigmore Valley Park area and parts of the existing airport overlay a former landfill, which was operational between 1937 and 1978. The construction works would require a section of the former landfill to be excavated and material from it to be treated and reused on-site, where appropriate.

We have considered potential risks to human health arising from contaminated soils, landfill materials, groundwater and leachate due to direct contact, inhalation of airborne contaminants and vapours and the accumulation of ground gases. The risk to buried structures from aggressive ground conditions and risk from ground settlement to the scheme where constructed over the landfill has also been considered. Due to the bombing of the airport during the Second World War, we have also assessed the risk of unexploded ordnance to be found at the site.

Preliminary findings from site investigations and generic and detailed risk assessments have indicated that the former landfill, and other areas of the scheme, do not pose a significant pollution risk to human health or the water environment, and that risks associated with existing ground conditions, including the potential for unexploded ordnance, can be appropriately managed.

Measures for reducing potential effects

Our aim is to minimise potential risks to human health and the environment relating to existing ground conditions and we are continuing to develop measures to mitigate these risks in consultation with statutory authorities. The design and construction strategy for our scheme accounts for the potential risks associated with building on a former landfill site. For example, the location and orientation of the extended platform has been designed to reduce the amount of landfill excavation required. The design of the scheme also includes ground gas protection measures and an engineered cover system within the design to prevent gas egress and contact with materials and perched water/leachate in the former landfill.

We are continuing to engage with statutory authorities to agree a remediation strategy and monitoring programme for the excavation of material from the former landfill. We will also apply for an environmental permit for the reuse of materials from the landfill.

Geotechnical design measures/mitigation will be incorporated to address issues of ground settlement and aggressive ground conditions for areas of the scheme constructed over the landfill, such as:

- use of ground improvement techniques
- flexible pavement
- continuous monitoring for settlement and use of an appropriate concrete class

To account for the risk of unexploded ordnance at the site, contractors will be required to adopt control measures, such as additional surveys and watching briefs. Further information on construction environmental management and mitigation of existing ground contamination is provided in our Draft CoCP (refer to **Appendix 4.2 in Volume 3 of the PEIR**).

With appropriate mitigation in place, no significant risks associated with existing ground conditions have been identified. The remediation of the former landfill is expected to result in beneficial effects, as it will improve the overall environmental conditions at the site.

Chapter 17 of the PEIR provides further detail on the assessment of likely effects associated with existing ground conditions.

Traffic and transport

Aspects of our proposals that could cause effects

We have assessed how our proposals could impact on road traffic, both during construction and operation of the expanded airport.

Our preliminary assessment demonstrates that even without any expansion at the airport, traffic within the area surrounding the airport is forecast to increase in the future, which could lead to greater congestion, causing delays and a reduction in average journey speeds.

The proposed expansion is forecast to increase traffic by between 0.6% and 0.8% depending on the time of day, averaged across the area surrounding the airport. Forecast traffic increases are likely to be the highest in Luton (up to

3.4%) and North Hertfordshire (up to 2.2%). The majority of this additional traffic is likely to be focused on the A1081 between the airport and M1 Junction 10, and then on the M1 itself to the north and south of Luton. In addition to this, there are forecast to be traffic flow changes in south east Luton and on local routes to the south and east of the airport. This forecast increase in traffic with the expansion at the airport would reduce average speeds on nearby roads. Across the surrounding area, average speeds are forecast to reduce by around 1%, in comparison to a scenario with no airport expansion, with the largest forecast reduction in speeds of up to 5.7% within Luton. Outside of Luton, North Hertfordshire and St Albans are forecast to experience the largest average speed reductions of up to 0.5%.

We have also considered the effect on public transport. The rail service at Luton Airport Parkway station has improved recently with the introduction of the East Midlands Rail Connect service in addition to the Thameslink services. This service runs between Corby and St Pancras International stations with a 30-minute frequency and is operated by electric multiple unit trains. Furthermore, Luton DART is expected to open in 2022. It is expected that improved facilities for buses and coaches provided by the scheme, together with the increase in air passengers, will provide an incentive for public transport operators to offer further improved and expanded services.

Measures for reducing potential effects

Our aim is for at least 45% of passenger journeys to the airport to be via public and sustainable transport, as an alternative to private vehicles, by a target date of 2039. The following key measures are included within our proposals to reduce extra traffic being created by the scheme:

- Extension of the Luton DART to serve the new terminal from the Luton Airport Parkway station.
- Proposed highway intervention works listed in section 4 of the main consultation brochure.
- Improvements to bus and coach services.
- Limited amount of new car parking for passengers and employees to reflect higher public transport take-up.

We will implement the following three key plans to adopt good practice for the management of traffic during construction and operation:

- Construction Traffic Management Plan (a draft version of this document is included within **Appendix 18.3 of Volume 3 of the PEIR**)
- Construction Workforce Travel Plan
- Framework Travel Plan (for airport operations) which will be closely integrated with the Green Controlled Growth strategy

With mitigation in place, changes in traffic flows during construction and operation are not likely to result in significant effects.

Further information on traffic flows generated by the scheme, and the potential effects on road users, is included in Getting to and from the airport – our emerging transport strategy and Chapter 18 of the PEIR.

Waste and resources

Aspects of our proposals that could cause effects

We have assessed how much waste our proposals for airport expansion would generate during construction, including any waste from demolition and excavation activities, and how much resource use, such as concrete, steel, and aggregates, would be required. In addition, we have estimated how much additional waste the increased number of passengers would generate and, where possible, how much further resource would be required to operate the expanded airport.

Measures for reducing potential effects

Our aim is for the scheme to minimise the amount of waste produced during its construction and operation and maximise the amount of reused and recycled materials incorporated within the design.

As the site includes a former landfill, a section of which would need to be excavated during construction, we are proposing to sort and reuse as much of the material excavated from the former landfill, as possible. The lead contractor will also be required to procure and use recycled, locally-sourced and sustainable materials, where possible, and identify opportunities to minimise the amount of materials to be taken off-site. We will set targets for the diversion of waste from landfill during the construction of the scheme and monitor compliance against these. We will continue to identify opportunities for designing out waste and specifying reused and recycled materials within the design. Construction waste would be managed in line with a Site Waste Management Plan (a Draft Outline Site Waste Management Plan has been included within **Appendix 19.1 of Volume 3 of the PEIR**). Reuse of non-landfill material (i.e. soils and demolition waste) would be managed in line with a Materials Management

Plan, prepared by the contractor. With this mitigation in place, no likely significant effects related to waste management or resource availability due to the scheme have been identified.

For further information on waste management and resource use, please refer to Chapter 19 of the PEIR and our Draft CoCP in Appendix 4.2 of Volume 3 of the PEIR.

Water resources

Aspects of our proposals that could cause effects

The scheme spans two river valleys, the River Lea, which is located approximately 450m to the south-west, and the River Mimram, approximately 3.5km to the east. The site is underlain by chalk bedrock, which provides a high level of groundwater storage. However, groundwater quality in the vicinity of Luton has been known to be poor due to pollution related to the surrounding area's industrial heritage. The majority of our chosen area for expansion is at low risk of flooding from rivers. However, areas of high flood risk from surface water flows have been identified across the site and off-site highway intervention work sites.

The existing airport manages surface water via a combination of discharge to public sewers and by soaking into the ground via a main soakaway. There are two Thames Water attenuation basins located on Eaton Green Road. Foul water is currently discharged to the public foul water network owned and operated by Thames Water. The public water supply assets are owned and operated by Affinity Water.

We have considered how the scheme could impact on the identified groundwater and surface water resources and the existing drainage network, as a result of changes to groundwater and surface water flow patterns, volume and quality. We have also assessed risks from the excavation and piling on former landfill which could expose and mobilise existing contamination and introduce new pollution pathways into the underlying groundwater.

Measures for reducing potential effects

During construction, appropriate working practices will be implemented to minimise risks associated with contamination and flood risk in line with a construction surface water management strategy. A piling risk assessment and method statement will be developed to manage contamination risks associated with piling works in the former landfill. We are also continuing to engage with statutory stakeholders to discuss requirements for a landfill remediation strategy and a monitoring programme.

We are developing a drainage strategy to control water run-off and prevent pollution due to the operation of the expanded airport. Hydrocarbon separators, real time monitoring of pollution levels and treatment facilities will be embedded within the design to control the risk of pollution from the drainage of the scheme. The drainage strategy is being designed to allow for an increase in rainfall because of climate change, and to store surface water during storm events to reduce the risk of flooding downstream. To minimise the risk of groundwater pollution during operation, a capping layer would be installed across the exposed section of landfill which, in combination with the drainage system, will keep rainwater out of landfill layers.

With appropriate mitigation in place, effects on the water environment will not be significant. Furthermore, remediation of the former landfill, and the installation of pollution prevention measures, are expected to result in significant beneficial effects, by reducing the risk of existing contamination polluting groundwater and the River Mimram, which is groundwater fed.

Further information on likely effects on water resources is provided in Chapter 20 of the PEIR.