

## Heathrow Expansion DCO Consultation Response Water and flooding

September 2019

---

### 1. Overview

- 1.1 This paper sets out the Mayor's response on water and flooding to the statutory consultation by Heathrow Airport Limited (HAL) on its expansion proposals.
- 1.2 The Mayor has a legal duty to set out policies and proposals in the London Environment Strategy for adapting to climate change and a duty to take action on climate change. The Climate Change Act 2008 and GLA Act 1999 require the Mayor to consider the impact of climate change and measures to mitigate for climate adaptation in London. The Mayor has set out in the London Environment Strategy and the London Plan policies to enable London and Londoners to be resilient to severe weather and climate change impacts, including flooding, heat risk and drought.
- 1.3 The proposals for expansion of Heathrow will result in heavy modification of watercourses in the area and hydrological connections with those watercourses through diversion, channelization and culverting. This will result in impacts on flood risk, water quality, water supply and ecology. The proposed mitigation measures are untested and over engineered. We do not think there is confidence in these measures averting the flood risk, water quality and biodiversity concerns. The project also proposes a number of interactions with water and wastewater infrastructure assets, which need to be agreed with the asset owners to avoid issues for access and maintenance.
- 1.4 Additionally, detail has not been provided as to measures to consider the wider impacts of climate change, both on the proposed development, but also how the proposed development impacts surrounding area.

### 2. The Mayor's strategies and the London context

- 2.1 The Climate Change Act 2008 sets the statutory framework for addressing climate change risks in the UK, and the GLA Act 1999 (as amended) requires the Mayor to consider the impact of climate change and potential mitigation proposals for adaptation for Greater London. The London Environment Strategy sets out the aim for London and Londoners to be resilient to severe weather and longer-term climate change impacts., including flooding, heat risk and drought.
- 2.2 The Mayor has a legal duty to set out policies and proposals in the London Environment Strategy for adapting to climate change, and a duty to take action on climate change. Part of this involves ensuring that climate change adaptation policies are included in the

other relevant Mayoral strategies, such as the London Plan and the Mayor's Transport Strategy, as well as the developments impacted by those strategies. Objective 8.1 of the Environment Strategy is to understand and manage the risks and impacts of severe weather and future climate change in London on critical infrastructure, public services, buildings, and people.

- 2.3 Objective 8.2 is to reduce risks and impacts of flooding in London on people and property and improve water quality in London's rivers and waterways. The Greater London Authority (GLA) is not a flood risk management authority. However, the Mayor produces a Regional Flood Risk Appraisal that sets out the general nature of flood risk across London and how it affects existing and proposed development. The Mayor is concerned with developments that might impact on flood risk or water quality in London.
- 2.4 The Mayor has no statutory responsibilities in relation to water resources and their associated supply and distribution infrastructure. However, the Mayor can influence water use and supply, to some extent, through the London Plan. It is also essential that the GLA maintains an oversight of strategic water resource planning and demand management measures to meet Objective 8.3 of the Environment Strategy to ensure efficient, secure, resilient, and affordable water supplies for Londoners.
- 2.5 There is no single authority responsible for managing heat risk in London. The Environment Strategy sets out in Objective 8.4 for London's people, infrastructure and public services to be better prepared for and more resilient to extreme heat events.

### **3. Impacts of river diversions and culverting on flood risk and water quality**

- 3.1 The DCO project proposes to divert, combine and culvert four watercourses, the Longford River, The Duke of Northumberland's River, the River Colne and Wraysbury River. The River Colne and Wraysbury River are proposed to be combined, as are the Duke of Northumberland's and Longford Rivers. Both the new combined rivers are proposed to be diverted into two channels that then flow next to each other within a combined, culverted 'Covered River Corridor' (CRC). The river diversions and channelling extend for multiple kilometres with the CRC extending 650 metres beneath the proposed new runway. The DCO project also proposes to realign Colne Brook and several smaller tributaries, infill five lakes and alter one other.
- 3.2 A culvert typically impacts on a river through physically inhibiting light to the channel and its riparian corridor and thereby preventing photosynthesis and vegetation growth. In addition, any animals or insects that need light to navigate will also be impacted. The Preliminary Environmental Information Report (PEIR) predicts significant negative effects on the Wraysbury River, River Colne, Longford River and Duke of Northumberland's River as a result of the river diversions proposed. The PEIR indicate that these changes would affect the amount and quality of habitat available. HAL proposes to address some of these negative effects through the design of the new river channels and the CRC, including 'an adaptive approach to lighting to encourage both aquatic plant growth and fish passage'. However, the PEIR indicates that there are still

uncertainties that result in a significant negative effect. Additionally, the PEIR indicates significant negative effects on lakes as a result of them being infilled, resulting in loss of open water and associated habitat.

3.3 The combination of constructing, diverting, channelling and culverting the watercourses raises several issues of concern. The combining of watercourses may lead to increased risk of flooding and water quality issues. The implications of moving and combining the watercourses creates added levels of risk and uncertainty as to cumulative up/down stream impacts, as well as changes in the interactions with nearby lakes and groundwater. The PEIR indicates that there are also the potentially significant cumulative negative effects between this project and the impacts of High Speed Two and their overlapping mitigation measures, as well as cumulative impacts with historical alterations due to previous Heathrow projects (namely the Terminal 5 mitigation measures within the Duke of Northumberland and Longford Rivers).

3.4 HAL's proposals do not adequately address the known negative effects of the major changes to existing rivers and lakes. We are concerned that this approach is over-engineered. The proposals seek to turn naturalised areas into hard infrastructure and the mitigation measures proposed to help address concerns rely on untested and technology-based solutions. Mitigation measures and concerns about them include:

- Ecological islands are proposed to provide otter habitat and fish refuge, however the specific impacts on ecology are not outlined in the PEIR and are not based on an evidence base.
- The proposal does not confirm whether or how the culvert structure will include open sections. Openings could result in issues with pollution from de-icing or fuel, as well as light intrusion.
- Artificial lighting is proposed to mimic daylight. No evidence is provided that shows this approach has been applied elsewhere or that this experience has been used to inform the design. The PEIR specifically states the proposed design is based only on literature reviews and minimal laboratory trials on light intensity requirements for growth. There is also no assessment of unintended consequences of artificial lighting, such as increased energy use and more difficult maintenance regimes.
- Impacts on airflow and temperature have not yet been addressed. The PEIR suggests further work is needed and may result in the need for mechanical ventilation. There is again no assessment of energy use, maintenance needs, cost or other impacts.
- The CRC will also need some sort of irrigation system to mimic rainfall. Proposed mitigation measures for this are not clear at this stage. A potential option would be an overhead irrigation system. This again has not been assessed for impacts on water consumption, cost or maintenance needs.
- The access requirements for all of the above mitigation measures, as well as the

need for establishment and maintenance of the vegetation is not fully developed.

#### **4. Additional flood risk concerns**

- 4.1 Culverting of water courses is generally against national flood risk policy as it increases the risk of obstruction and blockage which leads to backing up of water. It also has a more onerous and time-consuming maintenance regime due to limited access points and health and safety concerns. While frequency of maintenance needs for the CRC mitigation measures are provided, the PEIR does not acknowledge the increased risk or cost of maintenance of culverted watercourses compared to open or natural watercourses, let alone the additional maintenance needed for the various mitigation measures.
- 4.2 According to both the National Planning Policy Framework (NPPF) and the draft London Plan, flood storage provision should prioritise the use of natural flood management and other nature-based solutions that include water quality treatment elements and ecological enhancements. Flood storage should be designed to minimise the need for pumping and therefore energy required.
- 4.3 Also, there is no proposal for sustainable drainage systems for the site which will be required for surface water flood risk management and to help tackle water quality issues. These systems can also help provide much needed green infrastructure for the site.
- 4.4 The submission fails to provide a suitable Sequential Test, a standard requirement from the NPPF for all development within an area at risk of flooding and a requirement reiterated in the Airports National Policy Statement, The Sequential Test performed as part of the Airports Commission report (2015) indicated that expansion of Gatwick Airport was preferable in terms of flood risk impacts to either of the assessed schemes at Heathrow. An Exception Test is included but this fails to demonstrate that the development provides wider sustainability benefits to the local community that outweigh the flood risk.

#### **5. Impacts on water quality**

- 5.1 The DCO project may also lead to breaches in water quality and impact on the Water Framework Directive (WFD). HAL has not shown how water quality will be secured. The ANPS is explicit that “overall aim of development should be to prevent deterioration in status of water bodies, to support the achievement of the objectives in the Thames river basin management plan and not to jeopardise the future achievement of good status for any affected water bodies.” The proposals fail this test. HAL should state whether its project will require a derogation from the WFD.
- 5.2 The majority of nearby rivers are at Moderate overall status, except the River Crane, which is at Poor overall status. The majority of lakes (including reservoirs) are also at Moderate overall status. The Lower Thames Gravels groundwater body is at Good status.

- 5.3 Culverting of rivers can lead to a reduction in natural daylight which may impact water quality and WFD status. The short timeline that is proposed for the culverting and diversion of rivers is unlikely to allow for proper establishment of local ecology within the diversion route potentially leading to a reduction in WFD status. The uncertainty of time scales and risk to establishment are indicated in the Preliminary WFD Assessment.
- 5.4 Significant assessment of existing baselines and proposals for mitigation, in line with Environment Agency requirements is needed. This includes ensuring that enough time is spent doing baseline monitoring and it is done in enough places to truly understand the impacts. The timeline proposed in the PEIR is too ambitious and does not allow enough time to understand the complexity of overlapping issues and the most appropriate mitigation measures for the right locations. While locations for monitoring are provided, frequency and length of data collection are not. In the case of groundwater, a minimum of two years of monitoring would be ideal to establish a baseline. Locations like Bigley Ditch and Frogs Ditch should also have monitoring to help understand impacts on levels and flows. The data from any monitoring that takes place should be made available to the relevant stakeholders including as a minimum the GLA, EA and local authorities, in line with the recommendations of the Scoping Opinion. Also in line with the Scoping Opinion, monitoring should be done in a way that facilitates cross-disciplinary review and analysis.
- 5.5 In an era where most cities are daylighting or deculverting their rivers and naturalising them to gain more ecological and blue infrastructure benefits, the proposed diversion, combining and culverting of so many rivers is against the philosophy of enhancing green and blue infrastructure that London is trying to achieve. Furthermore, the documentation does not provide a clear indication as to the total length of watercourses removed or altered or area of lakes infilled. This is contrary to the Inspector's Scoping Opinion (June 2018) which states that, 'Any open water assessed in the ES should be clearly identified and classified by type.'

## **6. Impacts on water supply**

- 6.1 Affinity Water are the water supply company in this part of Hillingdon. It is not clear from the PEIR that the impacts of the project on Affinity's supply and transfer infrastructure in the area are fully understood.
- 6.2 There must be close coordination with Affinity for the level of pipeline diversions and reconfigurations in the DCO project. The proposed culverting of the River Colne may change the interaction between it and the neighbouring lakes. The hydraulic monitoring reports provided do not include a thorough hydrological analysis of the interactions between the diverted river channels, groundwater and nearby lakes and catchments. These interactions could have a direct and/or an indirect impact on base flows, groundwater levels or lake levels at the Egham lakes, which Affinity uses for emergency supply at times of poor water quality in the River Thames, which is likely to become a more common occurrence with climate change.
- 6.3 The PEIR has not adequately considered water demand and options for integrated water

management. Appendix 20.1 indicates an anticipated increase in water demand from a current level of 2.5 million cubic metres per year to more than 4 million cubic metres per year by 2040. The Airports Commission report (2015) raised this specifically and stated that 'effective measures also needed to ensure that increased demand for water at an expanded Heathrow could be met' and that 'water-intensive development should only be allocated in areas where sufficient water is available for use'. The PEIR does not provide an assessment of the potential impact of increased demand in water supply, nor does it provide proposals to offset that water demand through water efficiency or reuse.

- 6.4 Additionally, the PEIR does not address the potential consequential impact the DCO project will have on future water supply options for London, being considered by Thames Water and Affinity Water including a new reservoir, water reuse and canal transfers.

## **7. Impacts on wastewater**

- 7.1 The selected option proposed is to use the existing sewer network, with a pumping method for discharge. The HAL modelling suggests that there will be no increase in sewer demand from the DCO project. Given the capacity constraints in West London's sewer network and Mogden treatment works, these demand assumptions about offsetting sewer demand must be checked and verified with Thames Water to confirm whether there is sufficient capacity in the existing system.
- 7.2 If additional wastewater is generated, HAL should be implementing best practice integrated water management in line with the London Plan to prioritise options for reuse or enhancing river flows rather than just relying on discharge to the existing sewer network as proposed.

## **8. Consideration of climate change adaptation**

### *Cumulative climate change impacts*

- 8.1 There is no indication that HAL has given consideration to how the DCO project interacts with projected climate change impacts, including residual flood risk for future scenarios, impacts of drought on water courses and groundwater, impacts of high temperatures on infrastructure and the surrounding environment.
- 8.2 The PEIR does not currently assess the climate change impacts outside of the assets of the DCO project. The cumulative impacts of the project on increasing flood risk, heat risk or water scarcity elsewhere on the site must be assessed and mitigated.

### *Climate Change Adaptation Plan*

- 8.3 The principles for a future detailed Climate Change Adaptation Plan (CCAP) have been set out in the PEIR. While the proposals address some of the key climate impacts, the CCAP should do more to meet best practice for designing, delivering and monitoring adaptation and resilience measures, in line with Airports National Policy Statement, the

National Policy Statement for National Networks and guidance from IEMA on EIAs and Climate Adaptation. The CCAP should also identify funding needs and how they will be met.

- 8.4 The CCAP must include a detailed assessment of the risks of flooding, heat risk and water scarcity and provide actions that Heathrow will take to ensure the site is resilient to these risks and impacts of climate change. The PEIR indicates that the CCAP will set out adaptation measure for flooding, including ecosystem-based measures and vegetation. On heat risk, the PEIR CCAP principles indicate it will address heat risk, but provide no examples of measures or considerations to be included. On water scarcity, the CCAP principles suggests a circular economy approach, but does not commit to taking that approach and does not provide examples of how it might be executed.
- 8.5 The CCAP principles do not list any measures to reduce the impact of the development on the urban heat island effect through design, layout, orientation and materials chosen in line with London Plan policy. No specific reference is made to how the development will minimise the risk of overheating and reliance on air conditioning.
- 8.6 The CCAP principles make reference to the need to understand and consider dependencies on other infrastructure systems. No detail is provided as to how this will be assessed and embedded within the CCAP. One example of local impact is that construction traffic will affect local areas at the same time as HS2 construction on an already severely congested road network. This will may have a material impact on water company response times in the area. Extra measures may need to be implemented especially for vulnerable customers.

## **9. Opportunities**

- 9.1 Construction does potentially offer opportunities of increasing infrastructure capacity – for example Thames Water are investigating whether as part of the project they can relieve capacity at Mogden sewage treatment works and transfer this to Slough wastewater treatment works. Alternatively, there is an option to build new facilities as Mogden is currently near capacity and in the medium term cannot accommodate the further growth proposed in north west London.
- 9.2 London Plan policy requires development to consider opportunities to reduce mains water consumption and consider integrated water management. The PEIR fails to indicate any plans for the construction to take advantage of the opportunity to look at greywater or rainwater reuse systems to reduce potable water demand or the use of a broader integrated water management strategy.