The London Resort Development Consent Order

BC080001

Environmental Statement
Volume 2: Appendices

Appendix 8.2 – Detailed methodology

Document reference: 6.2.8.2
Revision: 00

December 2020

Planning Act 2008
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009
Regulation 5(2)(a)
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
Regulation 12(1)

[This page is intentionally left blank]

Appendix 8.2 ◆ Detailed methodology

CONTENTS

INTRODUCTION

8.2.1 This appendix presents the detailed methodology relating to Chapter 8: *Human health* (document reference 6.1.8) of the Environmental Statement as part of the DCO application.

DETAILED METHODOLOGY AND DATA SOURCES

Scoping

The 2014 scoping opinion

8.2.2 The Applicant submitted an EIA Scoping Report in 2014. The Secretary of State's Scoping Opinion is summarised below along with reference to where the relevant matters are addressed in this chapter of the ES.

8.2.3 The 2014 Scoping Opinion advised that:

> *'The Secretary of State considers that it is a matter for the applicant to decide whether or not to submit a stand-alone Health Impact Assessment (HIA). However, the applicant should have regard to the responses received from the relevant consultees regarding health, and in particular to the comments from the Health and Safety Executive and Public Health England.*
>
> *The methodology for the HIA, if prepared, should be agreed with the relevant statutory consultees and take into account mitigation measures for acute risks.'*

8.2.4 An assessment of human health has been scoped into the EIA. The requirement to consider human health in EIA was introduced in the 2017 EIA Regulations and it was not required when the Scoping Report was submitted in 2014.

8.2.5 At the time, Public Health England and the Health and Safety Executive offered advice concerning the assessment of potential effects on human health. In addition to comments on the general approach and receptors, these comments relate to:

Public Health England

- Impacts arising from emissions due to construction and decommissioning;
- Emissions to air and water;
- Land quality;
- Waste;
- Electromagnetic fields;

- Liaison with other stakeholders (PHE lists several stakeholders); and

- Other aspects (responding to accidents with potential off-site emissions, consideration of the Control of Major Accident Hazards (COMAH) regulations and the major accident off-site emergency plan, consideration of perception of risk and the impact on health).

Health and Safety Executive

8.2.6 As chapter one of this ES explains, LRCH submitted an EIA Scoping Report to PINS in June 2020 (caser reference BC080001), in order to secure an update to a Scoping Opinion issued in 2014. The Secretary of State's Scoping Opinion was published on 28 July 2020 (case reference BC080001). The table below provides a summary of the advice offered in the EIA Scoping Opinion 2020 along with the reference to where the relevant matters are addressed in this chapter of the ES.

Table 8.2.1 The Secretary of State's advice on health effects in the 2020 scoping opinion and the Applicant's response

Scoping comment	ES response and reference
4.2.1 - Potential effects from hazardous waste The Scoping Report seeks to scope out this effect on the grounds that the Environment Agency will regulate the Proposed Development as part of the consenting process and therefore significant effects would not arise. The Scoping Report also states that the assessment will cross refer to the waste and materials chapter of the ES but as the waste and materials section of the Scoping Report makes little reference how impacts on human health receptors would be considered, it is not clear how relevant this is to the assessment. The Inspectorate does not consider that sufficient information has been provided to support scoping these matters from the assessment. Accordingly, the ES should include an assessment of the impacts to human health from hazardous waste where significant effects are likely to occur. The Applicant should make effort to agree the approach to the assessment with relevant consultation bodies.	The potential health impacts arising from the production of hazardous waste have been considered in this assessment during both construction and operational phases. Consultation has been undertaken in relation to both the assessment of health outcomes and the technical assessment related to the production of hazardous waste. Chapter 19: *Waste and materials* (document reference 6.1.19) provides detail on the consultation undertaken to inform the technical assessment of the production of hazardous waste.
4.2.2. - Potential effects associated with exposure to contamination in soil The Scoping Report seeks to scope this out because it would be addressed in the soils, hydrogeology and	Chapter 18: *Soils, hydrogeology and ground conditions* (document reference 6.1.18) provides a description of the human health

Scoping comment	ES response and reference
ground conditions chapter of the ES. The Inspectorate notes that assessment of this matter is addressed in section 17 of the Scoping Report. The Inspectorate is therefore, content that this matter will be assessed in other relevant aspects of the ES. The Inspectorate considers that appropriate cross reference in the Human Health chapter of the ES to the relevant information would be useful.	effects expected to result from exposure to contamination in soil.
4.2.3 – Effects from water quality The Inspectorate does not agree that this matter can be scoped out. The Scoping Report provides insufficient evidence to support scoping these matters from the assessment. Accordingly, the ES should include an assessment of the impacts to human health from changes in water quality where significant effects are likely to occur. The Applicant should make effort to agree the approach to the assessment with relevant consultation bodies. The Inspectorate does not agree that this matter can be scoped out. The Scoping Report provides insufficient evidence to support scoping these matters from the assessment. Accordingly, the ES should include an assessment of the impacts to human health from changes in water quality where significant effects are likely to occur. The Applicant should make effort to agree the approach to the assessment with relevant consultation bodies.	The potential health impacts arising from changes in water quality have been considered in this assessment for both construction and operational phases. Consultation has been undertaken in relation to both the assessment of health outcomes and the technical assessment related to water quality. Chapter 17: *Water resources and flood risk* (document reference 6.1.17) provides detail on the consultation undertaken to inform the technical assessment of water quality.
4.2.4 – Effects associated with electrical safety The Scoping Report seeks to scope out this matter as the safety requirements are the responsibility of the construction site team management and the project management plans will refer to the relevant health and safety legislation. A site wide energy strategy will be developed which will engage with the relevant stakeholders on the generation, transmission and distribution required for the Proposed Development. The Inspectorate agrees that it appears unlikely that significant effects would arise and so this matter can be scoped out. However, if further assessment of the works required to construct the Proposed Development demonstrates that this is not the case then the matter should be scoped back in.	No further developments have arisen that would demonstrate the potential for significant health effects associated with electrical safety would occur. On this basis this topic remains scoped out of the health assessment.
4.2.5 – Effects associated with a changing global	The potential health impacts arising

Scoping comment	ES response and reference
climate The Scoping Report presents a less than clear approach with regards to the assessment of this matter in relation to human health. The Inspectorate considers that the ES should assess impacts to human health from climate change relevant to the Proposed Development and where significant effects are likely to occur. The Applicant should make effort to agree the approach to the assessment with relevant consultation bodies.	from climate change have been considered in this assessment during both construction and operational phases. Consultation has been undertaken in relation to both the assessment of health outcomes and the technical assessment of climate change. Further detail on the consultation undertaken for the technical assessment of climate change can be found in Chapter 20: *Greenhouse gas and climate change* (document reference 6.1.20).
4.2.6 – Relationship with transport, accessibility and movement chapter Chapter 9 [Land transport] of the Scoping Report states that the ES will consider the effects on access to open green space, recreational facilities and healthcare facilities and on personal injury accidents. The Public Health chapter of the ES should also cross refer to this assessment.	This cross-reference is included in this chapter. The main assessment outlines the other technical assessments considered in the production of this chapter.

External engagement

8.2.7 External stakeholder engagement in relation to health is ongoing. A summary of the engagement that has been undertaken up to the production of the chapter is provided below.

Public consultation

8.2.8 Over the period 2014 to present, LRCH has carried out several stages of public consultation. These included public exhibitions, extensive web-based information and a series of targeted workshop events, which included events related to health effects. After these events, engagement has been undertaken with various groups and individuals which had been identified during and prior to, these events. These included representatives from local charities, work programmes and educational institutions.

8.2.9 In 2014/15, London Resort carried out several stages of public consultation. Engagement with local authorities took place on a range of matters including health impacts during construction and once operational, with a focus on health provision on site and engagement with the NHS and Clinical Commissioning Groups (CCG). Further engagement was then also carried out with the NHS/CCGs where the approach to assessing health impact was explained.

8.2.10 General feedback from initial consultation undertaken in 2014/15 was that the health providers would like to be pro-actively involved more closely in the plans for onsite health provision and any emergency services. However, it was noted by many consultees that information was not yet sufficiently advanced for views to be reached on the likely scale or distribution of impacts. Feedback relevant to the assessment included the following:

- The need to ensure that as much detail as possible was included within the application so that the impacts could be understood clearly.
- The importance of considering different scenarios (best/worst case) where uncertainties existed.
- The importance of consultation on key health delivery issues, principally including the demand and constraint imposed on local healthcare services, so that local concerns, objectives and recommendations could be taken into consideration.
- As the locality is undergoing so much change, the importance of considering cumulative impacts along with other known developments and plans for the area was highlighted.

8.1. Leading up to the DCO application, further recent public consultation has been undertaken in via webinar. The human health related queries and responses from the public consultation events are shown in Table 8.1.

Table 8.1 Summary of 2020 London Resort public consultation questions and answers

Public consultation issue	ES response
Consideration of mental health: respondents indicated that the prioritisation of mental health was key for the assessment of health outcomes, and had a desire to ensure mental health was considered on an equal footing with physical health.	This assessment defines health using the definition established by the World Health Organisation. Throughout the assessment care has been taken to ensure that mental health considerations have been treated equally to those of physical health.
Electromagnetic pollution: 1 respondent to the public consultation identified concerns about the impact of additional electromagnetic pollution arising from the operation of the London Resort on health outcomes.	The impact of additional electromagnetic pollution arising from the operation of the London Resort on health outcomes is assessed within this chapter. It is found that this is not likely to result in a significant effect on human health.
Sustainable transport: 9 respondents directly identified that improvements to	Once operational, the improvements to the pedestrian and cycling access within the PSB are thought to

Public consultation issue	ES response
walking and cycling infrastructure resulting from the London Resort have the potential to positively impact health outcomes.	encourage active transport and lead to positive health benefits in this assessment.
The health impact of traffic associated with the London Resort: some respondents were concerned that the level of additional traffic generated by the London Resort once operational will lead to negative impacts upon health for local residents.	An assessment of the newly generated traffic on existing road links is undertaken in Chapter 9: *Land Transport* (document reference 6.2.9). The health assessment draws on the conclusions of Chapter 9 to assess the resulting implications for health arising from the additional traffic generated, alongside changes in active transport levels.
Use of river transport: respondents were pleased that river transport options were being considered for the transport of material for construction to minimise environmental impacts from increased traffic. In addition, some respondents were pleased at the inclusion of the ferry terminal once operational.	Construction activity associated with the London Resort will result in an increase in traffic, affecting health outcomes indirectly through changes in access to community assets and increase noise levels and air pollution. The use of the river for transport of materials will result in less road traffic, and less potential for the indirect health impacts of traffic during the construction phase. The impact on health outcomes of changes to traffic and active travel, air quality, noise, and access to community assets is considered individually within the assessment of effects.
Development of green infrastructure: public respondents identified the opportunity for the operation of the London Resort to contribute towards the development of open space and pedestrian and cycling networks across Swanscombe Peninsula. Some respondents were concerned that the loss of marshland resulting from the London Resort would impact health outcomes.	An assessment of the health impact of both construction and operational activities associated with the London Resort upon access to open space and walking and cycling routes is undertaken within the assessment of effects. It is concluded that the additional provision of green infrastructure once the London Resort is operational will contribute positively towards health outcomes.
Accessibility and inclusive design: a large number of respondents to the public consultation referenced the importance of accessibility and inclusivity for individuals with a range of health outcomes. 10 respondents specifically requested the inclusion of quiet areas onsite with reduced external stimuli.	The health impact of the inclusive design measures of the London Resort once operational is considered within the assessment of effects. The accessibility and inclusive design measures will enable wider access to leisure opportunities afforded by the London Resort, with accompanying health measures considered to positively impact health outcomes.
Impact upon healthcare services: some respondents highlighted the potential for	The health impact of the additional demand for healthcare services resulting from the construction and

Public consultation issue	ES response
additional demand for healthcare services to impact the already constrained provision of services in the local area.	operation of the London Resort is considered within the assessment of effects. Consultation has been undertaken with the healthcare delivery providers in Kent and Essex to determine the likely impact on the additional demand during construction and operation, and the measures that can be put in place to mitigate this impact. The consultation raised that the largest impact would likely be felt on A&E services, and that measures to reduce this burden by accounting for the demand in a non-emergency environment would be key to ensuring local A&E services do not become further constrained. Consultation will continue between the London Resort and local healthcare delivery providers, and this assessment concludes that this no significant adverse impact will occur on local healthcare services during construction and operation provided onsite health measures are put in place.
Healthy food: respondents indicated that they would be keen to see a range of food options, including options compatible with different dietary requirements such as halal, kosher, and vegan options.	A wide range of food will be provided to guests, visitors and onsite staff members, with accessible food options both within and outside the pay-line when operational. The health impact of the change in access to healthy and unhealthy food arising from the operation of the London Resort is considered within the assessment of effects.
Climate impact: a large number of respondents raised the sustainability and climate impact of London Resort as a critical issue. Some positive comments were received regarding London Resort's net-zero operational emissions target.	Climate change is strongly linked to health outcomes, and the health impact of the construction and operation of the London Resort on climate change is considered within the assessment of. Sustainability has been placed at the heart of the design of the London Resort, and as such the commitment to a net-zero emissions target for all operational activities will ensure that the London Resort will not result in a significant impact upon health through climate change.

8.2. Based upon early feedback and public consultation, further consultations continued with prescribed and non-prescribed consultation bodies in relation to health. Further feedback has included the following meetings.

Kent County Council (KCC)

8.2.11 The London Resort undertook a meeting on 09/10/20 with KCC's health team to discuss the proposed approach to the assessment of the impact of London Resort on local healthcare and social services infrastructure, alongside internal health mitigation measures to be built into the design of the scheme.

8.2.12 During consultation, KCC highlighted the importance of considering the financial burden placed upon local healthcare services by workers of and visitors to the London Resort. Discussions were held on the potential spatial scope at which the health effects should be assessed, including consideration of non-local impacts such as the use of major trauma centres located in London for airlifting patients with severe health issues.

Ebbsfleet Development Corporation (EDC) and Dartford Borough Council (DBC)

8.2.13 Consultation meetings were held on 14/8/20 and 14/10/20 with both EDC and DBC. These covered many key aspects relating to health. Some key themes included the need to liaise with the local Clinical Commissioning Group to understand local healthcare capacity and the timing of new delivery. The impact of construction workers on healthcare facilities was raised and the provision for onsite healthcare facility. It was also noted that the impact on healthcare is not all about GP provision, but should incorporate wider health services such as social and community services. There are wider outreach aspects of healthcare that should be considered within the assessment and the definition should be broader than previously envisaged, including maintaining a focus on mental health considerations.

8.2.14 Other points raised were the need to distinguish between the health effects associated with the displacement of businesses and a loss of jobs, in contrast to the new jobs created. The importance of the quality of the worker accommodation and how the health agenda fits in with other parts of the submission were raised as key points.

Ebbsfleet Development Corporation (EDC) and Dartford Borough Council (DBC)

8.2.15 Consultation meetings were held on 14/08/20 and 14/10/20 with both EDC and DBC. These covered many key aspects relating to health. Some key themes included the need to liaise with the local CCG to understand local healthcare capacity and the timing of new delivery. The impact of construction workers on healthcare was raised and the provision of an onsite healthcare facility. It was also noted that the impact on healthcare is not all about GP provision. There are wider outreach aspects of healthcare and the definition should be broader, including mental health considerations.

8.2.16 Other points raised were the need to distinguish between the health effects associated with the displacement of businesses and a loss of jobs, in contrast to the new jobs created. The importance of the quality of the worker accommodation and how the health agenda fits in with other parts of the submission were raised as key points.

EDC

8.2.17 A separate engagement with EDC took place on 21/10/20 to discuss the EDC's planning vision for development in the Garden City, including the provision and planning of additional healthcare infrastructure such as the Ebbsfleet Health and Wellbeing Hub.

8.2.18 For the assessment of health impacts, EDC outlined the importance of not restricting the study areas for the assessment of community impacts. EDC stated that some local residents have raised general concerns about current lack of access to GP provision within

the EDC boundary. This is reflected in the baseline data used for the assessment. It was noted that the existing plans for the delivery of additional GP facilities, with additional facilities was not likely to come forward prior to the inflow of construction workers. Emphasis was therefore placed on the importance of understanding the health provision that the London Resort will provide for construction workers during construction.

8.2.19 EDC is planning the delivery of a number of additional healthcare facilities, the largest of which being a Health and Wellbeing Hub located in proximity to Ebbsfleet International station. The form and quantity of healthcare provision of this facility is as yet undecided, and further consultation will be undertaken to align the healthcare provision on-site and the new infrastructure in the Health and Wellbeing Hub.

Thurrock Council (TC)

8.2.20 The Applicant met with TC's health team on 06/10/20 to discuss the potential health impacts arising from the London Resort on the north side of Thames, and how best to enable the greatest level of access to the economic opportunities generated by the London Resort for residents of Thurrock.

8.2.21 TC highlighted ongoing concerns surrounding access to healthcare facilities that may be affected by the development of the Lower Thames Crossing. The additional traffic generated by the London Resort may have the potential to confound these impacts.

8.2.22 TC suggested the incorporation of an in-combination effect upon neighbourhood amenity within the assessment of health effects. This effect would assess the impact of the London Resort on the physical environmental, thereby affecting health outcomes. Following these discussions, this effect has been added into the assessment of health impacts.

8.2.23 TC have provided some key data presented within the baseline analysis, detailing the difference in the prevalence of different vulnerable groups within the west and the east of Tilbury, and the respective levels of socio-economic deprivation within these areas.

8.2.24 Following submission, the economic development team at TC will be continually involved in the development of employment and skills initiatives, aligning the proposals with those currently underway in Tilbury, such as the Tilbury Towns Fund and Community Led Local Development programme.

The London Resort Employment and Skills Taskforce

8.2.25 The Applicant has formed an employment and skills taskforce. The London Resort Employment and Skills Taskforce – which includes representatives from local authorities, skills and education partners, schools, colleges and high education. This was formed to provide guidance on the development of the Outline Employment and Skills strategy. The board has also brought together schools, colleges and higher education providers in a series of workshops which informed the emerging education proposals outlined in the Employment and Skills Strategy.

8.2.26 The role played by creating employment and skills opportunities in improving health

outcomes has been widely agreed upon within stakeholder consultation. Income and economic security is a key driver of health outcomes, and many vulnerable groups face significantly inequalities in accessing these opportunities. The Employment and Skills Taskforce will promote place the health benefits of initiatives generated by the London Resort as a key point of focus.

Kent and Medway Clinical Commissioning Group (CCG)

8.2.27 The Applicant met with the CCG on 09/12/20 to discuss the health impact of the London Resort. The CCG agreed that the analysis outlined in this chapter is detailed and robust and agreed with the effect significance.

8.2.28 The CCG agreed with our assessment that there are healthcare constraints in the area, as identified by the baseline data in this chapter. They noted that Darent Valley Hospital has minimal potential for expansion, and hence their key concern is limiting unnecessary A&E trips. It is acknowledged that some A&E trips will be necessary where there is a serious injury but any measures to reduce trips to A&E would be vital. The CCG noted that the onsite facility will help but suggested alternative solutions to minimise the impact on A&E services. The possibility for building on recent innovative methods of delivering primary healthcare was highlighted. For example, directing onsite workers (both during construction and once operational) to use online GP services would enable them to access all required services as well as reducing potential impacts upon local services. Some other potential options noted included working collaboratively with the EDC and video links to the A&E.

8.2.29 The importance of collaborative planning was also highlighted. For example, directing temporary onsite construction workers to use online GP services would enable them to access any needs for regular prescriptions, as well as reducing potential impacts upon local services. Similarly, working collaboratively with the CCG to assess what the onsite facility should include. The Applicant is committed to ongoing engagement with the CCG and collaborative planning.

Other stakeholders

8.2.30 The London Resort has met with various local partners and stakeholders such as Locate in Kent, Visit Kent, The Education People, SELEP to discuss socio-economic and health aspects. This engagement has informed this assessment. For example, Locate in Kent and Visit Kent have provided information on the ability of the local housing stock and temporary visitor accommodation to respond to the changes in demand anticipated by London Resort. This consultation has informed the assessment of potential health effects associated with increased demand in the residential property market.

8.2.31 External engagement in relation to crime and security has been undertaken for the development of the security strategy with policing authorities including Kent Police Counter Terrorism Security Advisors, Kent Police *Designing Out Crime* Officers, Essex Police, Centre for the Protection of National Infrastructure and British Transport Police. Measures put in place for the prevention of crime proposed in response to this

consultation include the use of Crime Prevention through Environmental Design, the creation of an access control strategy and Security Control and Crisis Management Centre, and integration with the Public Address and General Alarm System.

S42 consultation

8.2.32 This section summarises the S42 consultation responses relevant to human health. It describes the key themes and how they have been addressed in the assessment.

Table 8.2.2 S42 consultation themes relating to human health and the Applicant's response

Theme from the S42 consultation	The Applicant's response
Concern about the influx of construction workforce on health outcomes in the area.	The effect of the construction workforce on human health has been considered in this chapter. Further detail on the numbers of construction workers and their accommodation options is presented within the Construction Workforce Accommodation Strategy (Appendix 7.8: *Construction Workforce Accommodation Strategy* (document reference 6.2.7.8).
Concern regarding the impact of the London Resort on existing health infrastructure both north and south of the Thames, including upon primary healthcare and Darent Valley Hospital. Particular attention is drawn to significant constraints in existing health infrastructure, with a number of services already operating over capacity.	This chapter assesses the impact of additional workers during the construction phase, and workers and visitors during the operational phase, on health services and infrastructure. The evidence presented within the baseline conditions is consistent with the consultation comments that there are significant constraints in a number of forms of healthcare provision locally, and without enabling further delivery of health infrastructure any additional demand generated will impact the ability of existing infrastructure to provide services.
Concern that the London Resort would place pressure for more housing growth and affordable housing generally, which would then result impact health outcomes. Concerns were raised that these existing pressures could mean that the additional demand from the London Resort could have a significant effect on the ability to access new and existing housing.	This chapter considers the resulting health effects of the impact of workers and visitors on the local housing market. Chapter 7: *Land use and socio economics* (document reference 6.1.7) considers the impact of the additional demand generated by workers and visitors, and this chapter considers the resulting health impact of these effects.
Some stakeholders raised the concern that there are areas of north Kent that face	Wherever health data are available at a geography smaller than local authority level,

Theme from the S42 consultation	The Applicant's response
greater levels of deprivation, and that this is hidden when considering evidence at the local authority scale.	this is presented and considered within the existing baseline conditions. Appendix 8.3: *Detailed baseline* (document reference 6.1.8.3) presents all the data considered within the baseline analysis of health conditions, and this includes consideration of deprivation at the local level. Highly localised data relating to health conditions is presented from the 2011 Census.
More information required to understand how the London Resort would maximise employment and skills. Consultees also emphasised the need to engage with local schools, colleges and universities.	An Outline Employment and Skills Strategy has been developed and is submitted with the DCO (Appendix 7.7: *Outline Employment and Skills Strategy* (document reference 6.2.7.7)). The strategy – which is summarised in this chapter – outlines the Applicant's approach to maximising the local work and training benefits of the London Resort and the engagement that has taken place with a variety of local stakeholders. In developing that strategy, the Applicant has also set up an Employment and Skills Taskforce which is a group of relevant local bodies which will continue to meet to advise on the implementation of the Employment and Skills Strategy.

Scope of the health assessment

8.2.33 This section of this appendix summarises the receptors, the potential effects and the spatial and temporal scope over which these effects are assessed. The approach to assessment in this chapter is consistent with that proposed in the Scoping Report. Some additional receptors populations have been added (see paragraph 8.2.39 for explanation of this change) and the spatial scope, whilst consistent with the study areas detailed in the Scoping Report, have been expanded upon in order to appropriately capture effects at different spatial levels, and renamed for ease of reference (see paragraph 8.2.50 for definitions and the rationale for each study area used).

8.2.34 This health assessment seeks to understand whether significant effects, identified in other relevant technical assessments, would result in health effects for the population, including for groups likely to experience a heightened effect which are collectively termed vulnerable groups. This chapter is informed by the following technical assessments, though other planning documents are also considered:

- Chapter 7: *Land use and socio-economics* (document reference 6.1.7)

- Chapter 9: *Land transport* (document reference 6.1.9)
- Chapter 10: *River transport* (document reference 6.1.10)
- Chapter 11: *Landscape and visual effects* (document reference 6.1.11)
- Chapter 15: *Noise and vibration* (document reference 6.1.15)
- Chapter 16: *Air quality* (document reference 6.1.16)
- Chapter 17: *Water resources and flood risk* (document reference 6.1.17)
- Chapter 18: *Soils, hydrogeology and ground conditions* (document reference 6.1.18)
- Chapter 19: *Waste and materials* (document reference 6.1.19)
- Chapter 20: *Greenhouse gas and climate change* (document reference 6.1.20)

8.2.35 The health assessment considers the *residual* effects of other EIA technical assessments – i.e. it only considers the effects post-mitigation. Where additional mitigation measures are relevant to the effect on human health but not the original technical assessments, these are presented in this chapter.

Receptors

Receptor populations

8.2.36 The receptors that could experience likely significant health effects are outlined in Table 8.2.3. Receptor groups include the general population and vulnerable groups, as described in the methodology section below.

8.2.37 This document uses the following definitions:

- **Health receptors**: the population of receptors identified by technical assessments; and
- **Receptor population**: the make-up of the study area (defined below), including the groups listed in Table 8.2.3.

Table 8.2.3 Receptor populations

Receptor population group	Receptor population
General population	Residents
	Workers in the area and on-site
	Visitors to the area (including those visiting the London Resort)
	Road and public transport users, pedestrians and cyclists (transport

Receptor population group	Receptor population
	users)
Vulnerable groups	Children and young people
	Pregnant women
	Older people
	Low-income groups and the unemployed
	Ethnic minority groups
	People with disabilities, neuro-cognitive conditions, long-term illness, or who experience mental ill health (including neuro-cognitive conditions, mental health issues and dementia, autism and epilepsy)
	Lesbian, gay, bisexual, transgender and queer and others (LGBTQ+) people
	Single parents
	Traveller populations

8.2.38 The receptors identified above have changed since the 2020 Scoping Report submission, in order to provide a more detailed breakdown of the receptors that are likely to be affected by the London Resort and reflect comments received during consultation. Road and public transport users, pedestrians, and cyclists (transport users) have been added as a receptor in the general population in line with general stakeholders' comments.

8.2.39 During consultation, stakeholders raised the need to align the vulnerable groups considered within the assessment to those outlined within Welsh Health Impact Assessment Support Unit (2015).[1] Public Health England also noted that the identification of vulnerable populations should be extended and consider the list of protected characteristics within the Equality Act. In response to this feedback, a number of vulnerable groups have been added as consideration, on top of those presented within the 2020 Scoping Report submission. The additional groups included are pregnant women, LGBTQ+ people, single parents and traveller populations. The list of vulnerable population groups is designed to align with guidance outlined within NHS HUDU (2019) and Welsh Health Impact Assessment Support Unit (2015).[2,3]

8.2.40 All vulnerable groups identified within these guidance documents are considered within the assessment, apart from refugee groups and people seeking asylum, as identified within Welsh Health Impact Assessment Support Unit (2015). These groups have not been added as vulnerable groups considered within the chapter as only limited evidence exists to suggest these groups would experience disproportionate impacts arising from the effects considered in this assessment. The impact on these groups is considered through the impact on the general population.

Identifying relevant sensitive health receptors and receptor populations

[1] Welsh Health Impact Assessment Support Unit, 2015, HIA Tool Kit v2: Appendix 2.
[2] NHS HUDU, 2019, Rapid Health Impact Assessment Toolkit.
[3] Welsh Health Impact Assessment Support Unit, 2015, HIA Tool Kit v2: Appendix 2.

8.2.41 Other technical disciplines identify specific receptor locations in the respective assessments. It is not the physical receptors themselves which are relevant for human health, but the individuals who live, work in or visit these receptors. The receptors identified in each individual technical assessment will vary but often include sensitive receptors such as education and research facilities, healthcare and care-home facilities and open spaces.

8.2.42 Technical assessments, such as the assessment of noise and air quality impacts, consider the locations where impacts are expected and conclude on locations where the most adverse effects are expected. On this basis, the effects described at these health receptors will be suitable for describing the potential effects experienced at other, similar, health receptors which are further away from the site or the road network, as effects will be no larger than those identified at the worst case health receptor locations.

8.2.43 There are also sensitive health receptors that may contain populations particularly vulnerable to health impacts, for example community uses such as community centres, aged care homes and childcare/education centres. These sensitive health receptors are expected to be particularly vulnerable to potential effects relating to air quality, noise and vibration, and transport. Appendix 8.3: *Detailed baseline* (document reference 6.1.8.3) maps the existing community facilities within a 500m radius of the Project Site (or just beyond) as these are the facilities that are considered most likely to be affected by the activities of the London Resort.

Identifying the presence of the receptor populations

8.2.44 To determine the health effects on receptor populations, the presence of receptor populations within the study area for each effect is determined. Due to limitations in available information, it is not always possible to determine the extent to which receptor populations are present in the study areas, particularly for non-resident receptors. For example, it is not possible to determine the number of individuals experiencing mental ill health who will visit the London Resort once operational. In identifying vulnerable groups, this assessment makes it clear where data are available and used, and where assumptions have had to be made in order to carry an assessment of the anticipated health effects. Appendix 8.3: *Detailed baseline* (document reference 6.1. 8.3) summarises the prevalence of resident receptor populations within each study area, including vulnerable groups, where data are available.

8.2.45 The recorded data are only available for the resident population, so the presence of vulnerable groups among residents is estimated based upon this. The presence of vulnerable groups among other receptors, such as workers, visitors and transport users, is not available from the data and hence must be assumed, through the application of a precautionary approach.

8.2.46 Whilst detailed statistics are not available for the exact receptor population within, or associated with, each of the receptors identified by other technical assessments, many of them have information which make it possible to make a simplistic assumption about the

prevalence of these groups – most obviously that care homes will have an older population, and that younger people attend schools and children's centres. Where data are not available at the appropriate geography to understand the presence of vulnerable groups, the assessment comments on the likelihood of vulnerable groups being present in that group, applying a conservative approach.

Identification of potential effects

8.2.47 Table 8.2.4 summarises the potential health effects considered to result from the construction and operation of the London Resort, and the receptor populations anticipated to be impacted by the effects.

8.2.48 A number of health effects that were not scoped into the 2020 Scoping Report are considered within the assessment to reflect consultation feedback. All effects considered in addition to those presented within the 2020 Scoping Report are outlined below:

Construction effects:

- Potential health effect of construction resulting in hazardous waste;
- Potential health effects of construction resulting in water contamination;
- Potential health effects of construction related to changes to levels of neighbourhood amenity;
- Potential health effect of construction workers on health services;
- Potential construction health effects related to a changing climate;

Operational effects:

- Potential health effect of increased flooding during operation;
- Potential health effects associated with the creation and disposal of hazardous waste during operation;
- Potential health effects related to water contamination arising from activities during operation;
- Potential health effects related to changes to levels of neighbourhood amenity;
- Potential health effects of provision of worker accommodation;
- Potential health effects of change in the demand for residential accommodation;
- Potential health effects from changes to access to healthy and unhealthy food;
- Potential health effects from changes in the transmission of communicable diseases; and
- Potential health effects related to a changing climate.

Table 8.2.4 Potential health effects and receptors

Activity	Health effect	Receptor populations(s)
CONSTRUCTION EFFECTS		
Displacement to land and property as	Potential health effect of displacement or change in access affecting public services and community facilities	Residents

Activity	Health effect	Receptor populations(s)
a result of the land take	Potential health effect of displacement or change in access to open spaces	Residents
	Potential health effects from displacement of commercial uses	Residents Workers
	Potential health effects from displacement of residential dwellings	Residents
	Potential health effect of changes to local traffic and transport and changes in use of active travel modes	Residents Transport users
Construction activity	Potential health effect of construction resulting in changes in noise and vibration	Residents
	Potential health effect of construction resulting in changes in air quality	Residents
	Potential health effect of construction resulting in hazardous waste	Residents Workers
	Potential health effects of construction resulting in water contamination	Residents Workers
	Potential health effects of construction related to changes to levels of neighbourhood amenity	Residents
	Potential effects of the presence of the construction workforce	Residents
	Potential health effect of work and training opportunities created	Residents
	Potential health effect of construction workers on health services	Residents Workers
	Potential construction health effects related to a changing climate	Residents Workers
OPERATIONAL EFFECTS		
Noise exposure	Any potential health effects associated with changes in noise and vibration	Residents Visitors Workers
Air quality	Potential health effects associated with changes in air quality	Residents Visitors Workers
Traffic and transport	Potential health effects from a change in local traffic and active travel	Residents Transport users
Electromagnetic field exposure	Potential health effects associated with changes in electromagnetic field exposure	Residents Visitors Workers
Flooding	Potential health effect of increased flooding	Residents Visitors Workers
Hazardous waste	Potential health effects associated with the creation and disposal of hazardous waste	Residents Visitors Workers
Water quality	Potential health effects related to water contamination	Residents Visitors Workers
Neighbourhood amenity	Potential health effects related to changes to levels of neighbourhood amenity	Residents
Inclusive design	Potential health effects associated with the inclusive design, site access and facilities in and around the London Resort	Residents Visitors Workers

Activity	Health effect	Receptor populations(s)
Existence of the London Resort	Potential health effects relating to changes in access to work and skills	Residents Workers
	Potential health effects of provision of worker accommodation	Workers
	Potential health effects of change in the demand for residential accommodation	Residents
	Potential health effects from a change in the demand for health services	Residents Visitors Workers
	Potential health effects from a change in the demand for public services and community facilities	Residents Workers
	Potential health effects associated with open space provision and amenity space	Residents Workers
	Potential health effects from changes in community cohesion	Residents
	Potential health effects from changes in crime and community safety (including fear of crime)	Residents Visitors
	Potential health effects from changes to access to healthy and unhealthy food	Residents Visitors Workers
	Potential health effects from changes in the transmission of communicable diseases	Residents Visitors Workers
Climate change	Potential health effects related to a changing climate	Residents Visitors Workers

Spatial scope (study areas)

8.2.49 The Project Site includes land located on both sides of the River Thames in the local authority areas of Dartford and Gravesham in north Kent, and Thurrock unitary authority in Essex.

8.2.50 The spatial scope of health impacts influenced by other areas of technical assessment in the EIA matches the study area used for each relevant technical area. Some technical assessments – including noise, air quality, flooding and transport – do not define specific study areas for a given radius of the Project Site. Instead they identify receptors which are expected to be subject to effects of the largest scale. The effects identified in these assessments are all close to the Project Site and of similar geography, so this assessment has defined a geography (see Neighbourhood Study Area in Table 8.2.5) to identify the receptor population that could be affected by the London Resort. The NSA covers all the significant effects identified within these technical assessments.

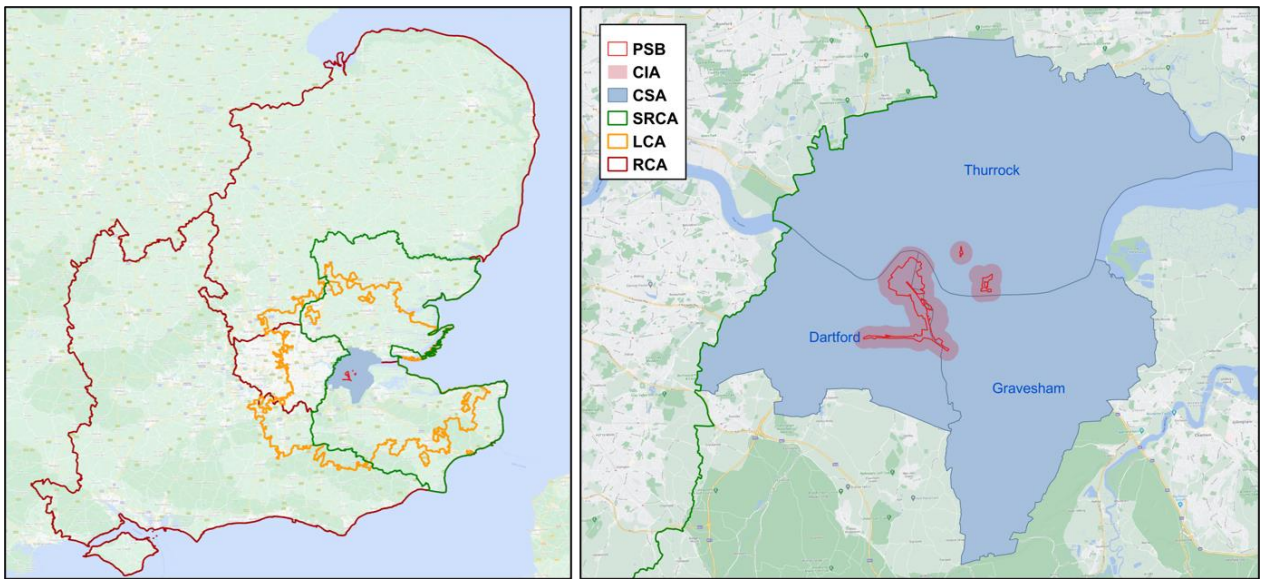
Table 8.2.5 Geographical study area definitions and rationale

Geographical Study Area	Definition	Rationale
The Project Site	The DCO Order Limits.	The PSB study area is used for effects

Geographical Study Area	Definition	Rationale
Boundary (PSB)		which are at the Project Site level. It is used for the assessment of the impacts of displaced uses.
Community Impact Area (CIA)	A 500m radius around the PSB.*	The CIA is used to assess the change in access to community uses, such as open spaces, public rights of way and other recreational or community facilities. Disruption to community uses is most likely to occur within relatively local proximity to the site.
Neighbourhood Study Area (NSA)	Area defined as the transport modelling area, with a 100m buffer applied. This is intended to capture all significant effects relating to traffic, flooding, air quality, noise and vibration and electromagnetic field exposure, informing the health baseline for those effects.	The NSA is used to assess technical effects relating to local traffic, air quality, noise and vibration, and others, and their impacts upon neighbourhood amenity. Many of these assessments are driven by the results of the transport assessment, and the NSA has been defined as a buffer zone around the transport study area such that it captures any significant resulting indirect effects.
Core Study Area (CSA)	Dartford, Gravesham and Thurrock (local authorities).	The three local authorities that the Project Site falls within. Many of the effects are expected to be experienced in the CSA.
Sub-Regional Context Area[4] (SRCA)	Kent and Medway, Essex, Thurrock (combination of districts).	These study areas are presented in the baseline for context but are not used to assess the significance of any health effects. They are included for context such that the health baseline and receptor population characteristics can be considered against appropriate wider areas.
Regional Context Area (RCA)	South East, East and London.	
National Area	England, GB, UK (depending on data source availability).	
* The CIA does not precisely correspond to a 500m radius around the Project Site Boundary as at the point of submission. It is slightly larger than a 500m radius. During statutory consultation, some stakeholders stated that this boundary should be no smaller than that defined for the PEIR to ensure all potential effects on community facilities and public services are captured within the study area. Therefore, although the Project Site Boundary has marginally decreased in area since the PEIR was published, the CIA study area has been kept the same.		

[4] Defined as county / unitary authorities to be consistent with ONS statistical data releases.

Diagram 8.2.1 Study areas



Contains Ordnance Survey data © Crown copyright and database right 2019

8.2.51 Table 8.2.6 shows the study area for each effect.

Table 8.2.6 Study area by effect

Activity	Effect	Study area
CONSTRUCTION EFFECTS		
Displacement to land and property as a result of the land take	Potential effect of displacement or change in access affecting public services and community facilities	CIA
	Potential effect of displacement or change in access to open spaces	CIA
	Potential effects from displacement of commercial uses	PSB
	Potential health effects from displacement of residential dwellings	Dartford
	Potential changes to local traffic and transport and changes in use of active travel modes	NSA
Construction activity	Potential effect of construction resulting in changes in noise and vibration	NSA
	Potential effect of construction resulting in changes in air quality	NSA
	Potential health effect of construction resulting in hazardous waste	CSA
	Potential health effects of construction resulting in water contamination	NSA
	Potential health effects of construction related to changes to levels of neighbourhood amenity	NSA
	Potential effects of the presence of the construction workforce	CSA
	Potential effect of work and training opportunities created	CSA
	Potential health effect of construction workers on health services	CIA
	Potential construction health effects related to a changing climate	CSA
OPERATIONAL EFFECTS		

Activity	Effect	Study area
Noise exposure	Potential health effects associated with changes in noise and vibration	NSA
Air quality	Potential health effects associated with changes in air quality	NSA
Traffic and transport	Potential health effects from a change in local traffic and active travel	NSA
Electromagnetic field exposure	Potential health effects associated with changes in electromagnetic field exposure	NSA
Flooding	Potential health effect of increased flooding	NSA
Hazardous waste	Potential health effects associated with the creation and disposal of hazardous waste	CSA
Water contamination	Potential health effects related to water contamination	NSA
Neighbourhood amenity	Potential health effects related to changes to levels of neighbourhood amenity	NSA
Inclusive design	Potential health effects associated with the inclusive design, site access and facilities of the London Resort	CIA
Existence of the London Resort	Potential health effects relating to changes in access to work and skills	CSA
	Potential health effects of provision of worker accommodation	CSA
	Potential health effects of change in the demand for residential accommodation	CSA
	Potential effects from a change in the demand for health services	CIA
	Potential effects from a change in the demand for public services and community facilities	CIA
	Potential effects associated with open space provision and amenity space	CIA
	Potential effects from changes in community cohesion	CIA
	Potential effects from changes in crime and community safety (including fear of crime)	CSA
	Potential health effects from changes to access to healthy and unhealthy food	CSA
	Potential health effects from the spread of communicable diseases	CSA
Climate change	Potential health effects related to a changing climate	CSA

Temporal scope (assessment years)

8.2.52 This section discusses the temporal scope that will be considered in the assessment of health effects.

8.2.53 The London Resort will be delivered over two phases of construction, with an operational phase of Gate One starting an estimated five years before the end of the construction activities for Gate Two. The proposed timescales are shown in Table 8.2.7.

Table 8.2.7 The London Resort indicative timescales

Phase	Construction phase	Operational phase
Gate One	2022 – 2024	2024 onwards
Gate Two	2026/27 - 2029	2029 onwards

8.2.54 A number of core assessment years have been chosen for this assessment as there will be a phased approach to the construction of the development, known as Gate One and Gate Two. This results in several complexities in the temporal analysis of effects. For example, the construction period of Gate Two will overlap with the operation of Gate One. The assessment will therefore consider several core assessment years to account for the length of the construction period and the phased approach to the opening of the London Resort. The core assessment year will vary depending on the nature of the effect. The assessment establishes parameters that are likely to result in the maximum adverse effect (i.e. the worst-case scenario).

Construction phases (2022 – 2029)

8.2.55 The construction phases for Gates One and Two will be continuous so there is effectively one construction phase for the purposes of the assessment. The core assessment years considered during the construction phase include:

- **2022**: the assessment year for effects relating to the displacement/loss of businesses and community uses. This is worst-case assessment as it is the earliest year in the construction phase; and

- **2023**: the construction of London Resort Gate One will be rapid, to achieve an opening date in 2024. For this reason, it is envisaged that the number of construction workers required on site will peak and remain broadly constant at this sustained peak from mid-2022 to mid-2024. The year 2023 will therefore be used to assess effects related to the construction workforce as this is the year in which the highest number of construction workers are anticipated to be on site.

Operational phases (2024 onwards and 2029 onwards)

8.2.56 Gate One is expected to become operational in 2024 and Gate Two is expected to be operational in 2029. For the purposes of this assessment, the operational phase will be defined as a single continuous phase, with several core assessment years:

- 2025: the first full calendar year of Gate One operations;

- 2030: the first full calendar year of Gate Two operations; and

- 2038: maturity – the London Resort will be fully operational and established.

Table 8.2.8 Assessment years for human health effects

Potential effect	Assessment year(s)
CONSTRUCTION EFFECTS	

Potential effect	Assessment year(s)
Potential effect of displacement or change in access affecting public services and community facilities	2022: start of construction phase
Potential effect of displacement or change in access to open spaces	2022: start of construction phase
Potential effects from displacement of commercial uses	2022: start of construction phase
Potential health effects from displacement of residential dwellings	2022: start of construction phase
Potential changes to local traffic and transport and changes in use of active travel modes	2022: start of construction phase 2023: construction peak
Potential effect of construction resulting in changes in noise and vibration	2022: start of construction phase
Potential effect of construction resulting in changes in air quality	2022: start of construction phase 2023: construction peak
Potential health effect of construction resulting in hazardous waste	2022: start of construction phase 2023: construction peak
Potential health effects of construction resulting in water contamination	2022: start of construction phase 2023: construction peak
Potential health effects of construction related to changes to levels of neighbourhood amenity	2022: start of construction phase 2023: construction peak
Potential effects of the presence of the construction workforce	2022: start of construction phase 2023: construction peak
Potential effect of work and training opportunities created	2023: peak construction workforce
Potential health effect of construction workers on health services	2023: peak construction workforce
Potential construction health effects related to a changing climate	2023: peak construction workforce
OPERATIONAL EFFECTS	
Any potential health effects associated with changes in noise and vibration	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Any potential health effects associated with changes in air quality	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effects from a change in local traffic and active travel	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effects associated with changes in electromagnetic field exposure	2022: start of construction phase 2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effect of increased flooding	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effects associated with the creation and disposal of hazardous waste	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effects related to water contamination	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity

Potential effect	Assessment year(s)
Potential health effects related to changes to levels of neighbourhood amenity	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effects associated with the inclusive design, site access and facilities of the London Resort	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effects relating to changes in access to work and skills	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effects of the provision of worker accommodation	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effects arising from changes in the demand for residential accommodation	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential effects from a change in the demand for health services	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential effects from a change in the demand for public services and community facilities	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential effects associated with open space provision and amenity space	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential effects from changes in community cohesion	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential effects from changes in crime and community safety (including fear of crime)	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effects from changes to access to healthy and unhealthy food	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effects from the spread of communicable diseases	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity
Potential health effects related to a changing climate	2025: first full year of the operation of Gate One 2030: first full year of the operation of the whole Resort 2038: maturity

Baseline

8.2.57 In the assessment of the baseline conditions, information is ordered and grouped in terms of relevance to each effect which the chapter then goes on to assess. Where baseline information is relevant to several effects, it is set out chronologically – that is to say the information is explained once, the first time it is relevant, and then the same information is cross referred back to as appropriate and required.

8.2.58 The data sources used to inform the socio-economic baseline are summarised in Table 8.2.9 sets out the data, the source, the year and the confidence. Confidence is a measure

of the reliability of the data source. Census 2011 has been used where appropriate as it still represents the most comprehensive and local set of data available for some of the indicators used in the assessment. It is acknowledged, however, that this source is increasingly out of date. For this reason, despite the accuracy and coverage of the Census, it is designated a confidence rate of medium rather than high, reflecting the fact that it may no longer be fully representative, rather than any reflection on its accuracy.

8.2.59 The year column in Table 8.2.9 shows the year in which the data were produced. In most instances that year is also the year for which the data are representative (for example the Census 2011 was collected in 2011 and represents data for 2011). However, in some instances the data were collected or produced in a given year but reflect a different period. This is most common in sources of forecasts which are used to inform the future baseline. An example of this is the five-year housing supply, where the forecasts were made in 2016, 2018 and 2019 (different for each of the three local authorities which make up the CSA) but represent housing need for future five-year periods.

Table 8.2.9 Data sources used to inform the economic assessment

Data	Source	Year	Confidence[5]
Self-reported health, proportion of people with disabilities or long-term illness at relevant geographies, proportion of households with access to a car or a van	ONS, the Census	2011	High
Life expectancy, health inequalities, proportion of children or adults overweight or obese, proportion of adults physically active, mortality rate from various diseases, numbers of noise complaints registered, proportion of population exposed to traffic noise, hospitalisation rates for various diseases	Public Health England: Local authority fingertip profiles	2019	High
Health trends for England	Public Health England, Health Profile for England 2019	2019	High
Health priorities and key issues of Kent	Kent County Council, Joint Strategic Needs Assessment	2016	High
Sexual health priorities and key issues of Kent	Kent County Council, Joint Strategic Needs Assessment: Sexual Health	2017	High
Health priorities and key issues of Thurrock	Thurrock Council, Joint Strategic Needs Assessment	2012	High
Deprivation rankings, deprivation rankings on individual subdomains	MHCLG, English indices of deprivation	2019	High

[5] Confidence level based on the organisation responsible for collating data sources (high = regulatory source and highly representative of required baseline information, medium = regulatory source but not very representative or non-regulatory source but highly representative, low = non-regulatory source and not very representative of required baseline information.)

Data	Source	Year	Confidence[5]
Access to Healthy Assets and Hazards deprivation measure	Consumer Data Research Centre, Access to Healthy Assets and Hazards	2019	High
2018 Mid-year population estimates (by LSOA, MSOA, Region and country)	ONS, Population Estimates for UK, England and Wales, Scotland and Northern Ireland	2019	High
Estimates of the proportion of households in poverty	ONS, Small area model-based households in poverty estimates, England and Wales: financial year ending 2014	2019	High
Proportion of ethnic minorities at relevant geographies	ONS, Annual population survey	2019	High
Key health priorities and outcomes sought in Kent	Kent County Council, Joint Health and Wellbeing Strategy	2015	High
Key health priorities and outcomes sought in Thurrock	Thurrock Council, Health and Wellbeing Strategy	2016	High
GPs	NHS Digital – GP Workforce Statistics March 2020	2020	High
Dentists	NHS Dental Statistics, 2019-20	2020	High
Pharmacies	Ordnance Survey, AddressBase Plus	2020	Medium
Community uses			
Emergency services			
A&E attendances and percentage admitted, transferred, or discharged within 4 hours or less 2018-2019	NHS Digital, Provider level analysis for HES Accident and Emergency Attendances	2019	High
Proportion of the population with a high anxiety score	NHS, Self-reported wellbeing - people with a high anxiety score	2017	High
Sleep time guidelines	National Sleep Foundation	2015	Low
Proportion of the population that sleeps certain amounts per night	Sleep Council, The Great British Bedtime Report	2017	Low
Prevalence of smoking among workers in manual occupations	ONS, Adult smoking habits in the UK: 2018	2019	High
Working age residents employed in construction	ONS, Annual Population Survey, January to December 2019	2019	High
Resident qualifications			
Workplace qualifications			
Economic activity of residents			
Business counts by size and industry	ONS, UK Business Counts, 2019	2019	High
Tourism bedspaces within CSA	Visit Britain Accommodation Stock Audit, 2016	2016	High
Private rented sector bedspaces within CSA	MCHLG, Live tables on dwelling stock (including vacant properties), Table 615 All vacant dwellings by local authority district, England, 2018	2018	High
Owner occupied bedspaces within CSA			
Employment	ONS, Business Register and Employment Survey, 2018	2018	High
Employment growth			
Employment by industry			
Jul 2019 Claimant Count	ONS, Claimant Count by sex and age	2019	High

Data	Source	Year	Confidence[5]
Apr 2018- Mar 2019 Unemployment	ONS, Model-based estimates of unemployment	2019	High
Not in employment, education or training (NEET)	Department for Education, NEET and participation: local authority figures, 2019	2019	High
Construction employment growth 2019-2023	Construction Skills Network forecasts 2019-2023, 2019	2019	Medium
Jan 2018 – Dec 2018 Qualifications of those in employment (total, by industry), Resident Qualifications, On the job training	ONS, Annual Population Survey	2019	High
Apr 2018- Mar 2019 Employment Rate, Economic Activity Rate, Economic Inactivity Rate,	ONS, Annual Population Survey (Workplace Analysis)	2019	High
Jan 2019- Dec 2019 Employment Rate, Economic Activity Rate, Economic Inactivity Rate, for the healthy and the disabled population			
Apr 2018- Mar 2019 Occupation and Industry employment	ONS, Annual Population Survey	2019	High
Earnings	ONS, Annual Survey of Hours and Earnings, 2019	2019	High
Apprenticeship starts, achievements, by size, by level, by industry 14/15 to 17/18	Department for Education, Apprenticeships and traineeships data	2019	High
Self-reported levels of social ties and community support	Department for Digital, Media, Culture & Sport, Community Life Survey 2018-19	2019	High
Crime over time to 2019	ONS Crime Statistics, 2019	2019	High
Proportion of respondents who meet with friends at least once a week; Proportion of respondents agreeing that there are people who would be there for them if they needed help; Proportion of respondents who could call on people if they wanted company or to socialise	Department for Digital, Media, Culture & Sport, Community Life Survey 2018-19	2019	High

Assessment methodology

8.2.60 Chapter 6: *EIA assessment methodology* (document reference 6.1.6) of this ES outlines the general assessment approach adopted for this EIA. There is not any current UK legislation or government guidance that details the specific content that is required to complete a health assessment. The health assessment takes account of guidance produced by a number of health authorities for the assessment of impacts.

8.2.61 A key aspect of this health chapter is establishing health pathways – these determine the relationship between the activities of the London Resort and potential health effects for

the receptor population. These are identified through a literature review (see Appendix 8.4: *Literature review* (document reference 6.1. 8.4)) which summarises the literature on the links between health determinants and effects on individuals' health. It contains the evidence base which underpins the assessment of the London Resort's health effects. For example, the literature review considers the relationship between air quality and health effects, and how this differs by group.

8.2.62 The assessment procedure for determining effects in this chapter is provided below:

- identification of the health receptors and receptor populations potentially affected by the London Resort;

- assessment of the sensitivity of these receptors based on the number of people exposed to the health effect and the extent to which the exposed receptor population are vulnerable to the effect identified. This is informed through stakeholder engagement, and desk-based studies of policy and baseline datasets. An assessment of how the sensitivity of receptors may change under future baseline conditions is also provided, particularly with respect to changes in demographic and economic variables such as population and employment. In response to stakeholder feedback, where possible and relevant, consideration is given to how COVID-19 may have altered baseline or future baseline conditions;

- assessment of the mechanisms through which the London Resort may impact identified receptors. This is informed by the strength of links between health determinants and health outcomes (health pathways) informed by the wider scientific literature, as well as other factors (such as size of the change, whether impacts meet policy); and

- combining the sensitivity of the receptor with the magnitude of impact, the significance of effect is determined.

8.2.63 Effects are identified from the interaction between the magnitude of impacts and the sensitivity of receptors.

Receptor sensitivity

8.2.64 From a health assessment perspective, sensitivity is interpreted as the ability of the health outcomes for individuals to be maintained following a change in environmental conditions. This ability may be influenced by existing inequalities in health outcomes, or a high prevalence of population groups specifically vulnerable to each effect.

8.2.65 The sensitivity of receptor populations is defined as high, medium, or low. For health effects, the receptor sensitivity is determined by the number of people exposed to the health effect and the extent to which the exposed population experiences inequalities in health or can access services and facilities. A receptor population with a high sensitivity would consist of individuals whose health outcomes are very sensitive to most changes,

whilst a low sensitivity would consist of individuals whose health is not likely to be sensitive to changes to their environment.

8.2.66 Vulnerable population groups include those with higher levels of social deprivation or relatively poor health status. The vulnerable groups are shown in Table 8.2.3. Vulnerable groups present in each study area have been identified in the vulnerable populations section of Appendix 8.3: *Detailed baseline* (document reference 6.1.8.3), and Appendix 8.4: *Literature review* (document reference 6.1.8.4) considers which groups are vulnerable for each health effect.

8.2.67 For example, as a general finding of the literature, children are vulnerable to changes in access to public open space. If the open space baseline found an existing deficiency in local publicly accessible open space, and low levels of physical activity and high numbers of children present in the study area, the sensitivity of the receptor population to health effects would be high.

8.2.68 The rationale for the sensitivity of the receptor population is summarised within the baseline subsection for each effect.

Impact magnitude

8.2.69 The assessment of the magnitude of impact has been undertaken based on professional judgement, informed by the literature identified in Appendix 8.4: *Literature review* (document reference 6.1.8.4) regarding the links between the various changes anticipated as a result of the London Resort and potential health effects, as there are no industry standard criteria relating to the assessment of the magnitude of health impact. The strength of the evidence linking activities to health outcomes is also assessed and is based on the rating-system presented in Table 8.2.10.

Table 8.2.10 Evaluation of the strength of evidence – ratings

Strength of evidence	Description
Strong	A wide range of peer-reviewed research has found an association between the determinant and health outcomes. There is consensus in the scientific community about the existence of the association.
Moderate	Several peer-reviewed studies have found an association between the determinant and health outcomes. There is broad agreement in the scientific community about the existence of the association, but there may be a number of dissenting voices about the particulars.
Weak	A few peer-reviewed or non-peer-reviewed research articles have found an association between the determinant and health outcomes. There is little consensus in the scientific community, or there are conflicting studies.

8.2.70 Where strength of evidence is 'weak' it is not considered evidence for the lack of a potential relationship between the project activities and health outcomes. It may instead reflect gaps in the state of our (and, more generally, the scientific community's) knowledge about the causal links involved. However, it does show that there is uncertainty in the assessment of the likely effect. The assessment of the strength of the evidence can be found in Appendix 8.4: *Literature review* (document reference 6.1.8.4).

8.2.71 Several factors are considered when assessing the magnitude of impact:

- the size of the change;
- whether health priorities or policy have been set for the relevant health determinant; and
- the strength of the evidence linking impacts to health outcomes.

8.2.72 The magnitude of impact is assessed as high, medium, low or negligible.

Significance of effect

8.2.73 Table 8.2.11 shows how the magnitude of impact and sensitivity of receptor combine to determine the scale of the effect. Effects can be beneficial, adverse or neutral; temporary or permanent; and, direct or indirect.

8.2.74 Embedded mitigation is referred to and included in the initial assessment of effects. If the effect does not require secondary mitigation (or none is possible), the residual effect will remain the same. If, however, secondary mitigation is required, an assessment of the post-mitigation residual effect is provided in a separate section at the end of the chapter.

Table 8.2.11 Effect significance matrix

Significance magnitude	**Sensitivity of receptor**		
	High	**Medium**	**Low**
High	Major	Major	Moderate
Medium	Major	Moderate	Minor
Low	Moderate	Minor	Negligible
Negligible	Minor	Negligible	Negligible

8.2.75 For the purposes of this assessment, effects that are classified as moderate or major are considered to be significant.

Assumptions and limitations

Engagement

8.2.76 Engagement is ongoing and will continue post-submission. This chapter reflects engagement to date.

Baseline data

8.2.77 The assessment of the existing environment is naturally limited to the availability of baseline data. Existing baseline conditions have been established through interpretation of nationally recognised research, data and survey information, and consultation with stakeholders. The most recent data published for the given study areas are used throughout this assessment, with a preference for using the most up to date data (2018, 2019 or 2020) where possible. Where data from these years are not available, the next best alternative has been used (i.e. the most up-to-date). In some cases, the next best alternative dataset will be the 2011 Census, which although now dated, provides very detailed spatial information for a large number of different indicators and includes the whole population.

8.2.78 The data sources are referenced throughout the chapter and the data are sourced from the ONS, NHS, or other local health authorities where possible. Baseline data will continue to be updated prior to the application for consent, as more recent datasets are published over the coming months.

8.2.79 Information on the future baseline is presented where available, outlining based upon anticipated changes in environmental conditions relevant to health. It is acknowledged that this exercise will only form a partial explanation of the baseline conditions relevant for health, as for example, no evidence is available detailing how levels of neighbourhood amenity are anticipated to change up to the assessment year. However, all available information is considered in determining the relevant receptor sensitivity for each effect, including the anticipated changes in baseline conditions up to the point of assessment.

COVID-19

8.3. The assessment presents baseline data over a reasonable period of time, where time series data are available, so that the impact of any short-term changes can be identified in the baseline. This may be relevant to the impact of COVID-19 on social, economic, demographic and health baseline data given the significance of the environmental changes brought about by the pandemic. However, there are a number of sources which state that the impact of the pandemic is not expected to be persistent, with recovery to pre-pandemic levels expected by 2024 (the opening year of Gate One).[6] This indicates that the impact of COVID-19 is largely relevant for short-term effects and it would not be a material consideration for the operational effects.

8.2.80 Where relevant, the impact of COVID-19 on the receptor sensitivity and conclusions is discussed in Chapter 8: *Human health* (document reference 6.1.8) and Appendix 8.3: *Detailed baseline* (document reference 6.1.8.3). Where there is uncertainty, the

6 Bank of England (2020); Monetary Policy Report August 2020

assessment is based on a reasonable worst-case scenario. Whist this assessment aims to identify possible future scenarios where possible, the impact of COVID-19 is uncertain and will depend on many factors, not least for how long the pandemic persists. This represents an unavoidable limitation in this assessment.

Health effects

8.2.81 The health assessment considers the residual effects of other EIA technical assessments – i.e. it only considers the effects post mitigation. The explanations of these mitigation measures are not repeated in this HIA and reference should be made to the respective technical topic chapter of the ES. The same assumptions and uncertainties of these assessments therefore apply to this chapter.

Cumulative effects assessment

8.2.82 The cumulative effects assessment detailed in this section is based upon professional judgement, taking into account the levels of significance identified in the other technical assessments undertaking within the ES that inform the assessment of health effect, for example the assessment of air quality presented within Chapter 16: *Air quality* (document reference 6.1.16).

8.2.83 The baseline assessment presents information on the evolution of the baseline for some health indicators where available. These are not always available for all assessment years on a consistent basis across all relevant geographies and so available data, uncertainties and limitations are presented and explained within each effect. Employment and housing projections, future infrastructure projects and developments the planning process inform the socio-economics assessment, the land and river transport assessments, the noise and vibration assessment, the air quality assessment, the landscape assessment, the water resources and waste assessments, and the greenhouse gas and climate change assessment. Therefore, where these assessments inform the health aspect, for example in considering the health impact of changes in transport access to community facilities, no additional cumulative assessment is required.

8.2.84 Consideration of the technical assessments is therefore inherently cumulative, and a separate assessment of the cumulative impact of committed schemes would risk double counting cumulative impacts. Based on this approach, the need for a cumulative effects assessment which considers the overall impact of other, committed, schemes is redundant. This approach was agreed upon within 2020 Scoping Report which noted that:

'the only exception to this is where specific cumulative schemes have a direct impact upon health provision or health outcomes (e.g. a scheme including a hospital or increase to open space). In these instances, the impact of this would be explicitly included here in the cumulative assessment.'

8.2.85 Chapter 7: *Land use and socio-economics* (document reference 6.1.7) presents information on changes in the future baseline relevant to this health assessment. For example, it considers if any identified cumulative developments are anticipated to result

in changes to community facilities, public services and public rights of way. These changes to the future baseline are identified in the baseline of this health assessment.

8.2.86 Stakeholder feedback on the 2020 Scoping Report highlighted that this approach was appropriate, but that the cumulative effect on health arising as a result of a combination of environmental impacts should be considered within the assessment. An additional effect upon overall neighbourhood amenity has been assessed at both the construction and operational phases to consider the potential in-combination health impact.