



ENVIRONMENTAL STATEMENT
VOLUME 1
CHAPTER 7 – AIR QUALITY

7. AIR QUALITY

7.1. INTRODUCTION

- 7.1.1. This Chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Development upon air quality. This Chapter considers the potential impacts of the construction and operation of the Proposed Development on existing sensitive receptors located in the vicinity of the Site.
- 7.1.2. This Chapter describes the assessment methodology, the baseline conditions at the Site and in the surrounding area, any primary and tertiary mitigation adopted for the purposes of the assessment, a summary of the likely significant effects taking into account national legislation, the further mitigation measures required to prevent, reduce or offset any significant negative effects, and the likely residual effects and any required monitoring after these measures have been employed.
- 7.1.3. This Chapter (and its associated figures and appendices) is intended to be read as part of the wider ES, with particular reference to **Chapter 2: Approach to the Assessment**, **Chapter 4: The Proposed Development** and **Chapter 6: Transport and Access**.

7.2. LEGISLATION, POLICY AND GUIDANCE

LEGISLATIVE FRAMEWORK

- 7.2.1. The applicable legislative framework is summarised as follows:
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (**Ref 7.1**).
 - The Air Quality (England) Regulations 2000 (The Stationary Office, 2000) (**Ref 7.2**).
 - The Air Quality (England) (Amendment) Regulations 2002 (The Stationary Office, 2002) (**Ref 7.3**).
 - Statutory Instrument 2010, No 1001, The Air Quality Standards Regulations 2010 (The Stationary Office, 2010) (**Ref 7.4**).
 - Local Air Quality Management (LAQM) Technical Guidance (TG16) (Defra, 2018) (**Ref 7.5**).
 - The Clean Air Strategy (Defra, 2019) (**Ref 7.6**).
- 7.2.2. Further detail on the above legislation is provided in **Appendix 7.1**.

PLANNING POLICY

- 7.2.3. The following key policy documents which are applicable to the Proposed Development have been summarised as follows:
- Cherwell Local Plan 2011-2031 (**Ref 7.7**);
 - The National Planning Policy Framework (NPPF) (**Ref 7.8**); and
 - Planning Practice Guidance (**Ref 7.9**).
- 7.2.4. The Cherwell Local Plan 2011-2031 (**Ref 7.7**) was formally adopted in July 2015 and contains strategic planning policies for development and the use of land. The following policy is relevant to air quality:

“Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment

Protection and enhancement of biodiversity and the natural environment will be achieved by the following:

[...]

- *Air quality assessments will also be required for development proposals that would be likely to have a significantly adverse impact on biodiversity by generating an increase in air pollution*

[...]”

7.2.5. Relevant information in the NPPF and PPG is detailed in **Appendix 7.1**.

GUIDANCE

7.2.6. The following guidance documents have been used during the preparation of this Chapter:

- Local Air Quality Management (LAQM) Technical Guidance (TG16) (Defra, 2018) **(Ref 7.5)**.
- Environmental Protection UK and Institute of Air Quality Management ‘Land Use Planning and Development Control: Planning for Air Quality’ v1.2, 2017 **(Ref 7.10)**.
- Institute of Air Quality Management ‘Guidance on the Assessment of Dust from Demolition and Construction’ v1.1, 2016 **(Ref 7.11)**.

7.3. CONSULTATION, SCOPE, METHODOLOGY AND SIGNIFICANCE CRITERIA

CONSULTATION UNDERTAKEN TO DATE

7.3.1. **Table 7.1** provides a summary of the consultation activities undertaken in support of the preparation of this Chapter.

Table 7.1 - Summary of Consultation Undertaken to Date

Body / organisation	Individual / stat body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
Cherwell District Council	Neil Whitton, Environmental Protection Officer in the Environmental Health and Licensing department	25 th April 2019 – Response to air quality methodology sent via email on the 23 rd April 2019 by Hoare Lea	The air quality methodology was agreed by Mr Whitton and he requested that electric vehicle charge points were to be installed in “all new residential and commercial development in the district.” It has been confirmed by Motion, the appointed Transport Consultant for the Proposed Development, that there will be a provision of 10% of parking facilities to have electric vehicle (EV) charging facilities. Further detail on the EV charging facilities is available in Chapter 6: Transport and Access.
Cherwell District Council	Jim Guest, Environmental Protection Officer in the Regulatory Services and Community Safety department	22 nd May 2019 – Response to air quality methodology sent via email on the 23 rd April 2019 by Hoare Lea	The air quality methodology was also reviewed and agreed by Mr Guest and no further comments were provided. Additional correspondence with Mr Guest was undertaken between May and September 2019 in order to obtain 2018 Cherwell District Council monitoring data for use in the assessment.
Cherwell District Council	Jim Guest, Environmental Protection Officer in the Regulatory Services and Community Safety department	21 st October 2019 – Email provided to the LPA	Awaiting response regarding the assessment of the proposed energy strategy as detailed information on combustion plant unavailable.

SCOPE OF THE ASSESSMENT

- 7.3.2. An EIA Scoping Report was submitted to Cherwell District Council in June 2019, as presented in **Appendix 2.1**. Further information can be found in **Chapter 2: Approach to the Assessment**.
- 7.3.3. This section provides an update on the scope of the assessment and re-iterates the evidence base for insignificant effects following further iterative assessment since submission of the EIA Scoping Report in June 2019.
- 7.3.4. The scope of the Air Quality Assessment has remained unchanged since the submission of the EIA Scoping Report which was agreed via Cherwell District Council internal email by Mr Neil Whitton (Cherwell District Council Ref: 19/01255/SCOP).
- 7.3.5. The Air Quality section of the EIA Scoping Report stated that potential for significant effects was likely to be associated with the impacts on existing sensitive receptors i.e. residential properties as a result of fugitive dust emissions during the Construction Phase and traffic emissions during the Operational Phase of the Proposed Development.

- 7.3.6. The Air Quality section of the EIA Scoping Report scoped out the requirement to assess effects on existing ecological receptors in the locale and existing human receptors in the Bicester Air Quality Management Area (AQMA) as due to the distance of the nearest ecological receptor and the AQMA from the Site, potential effects are considered to be insignificant. However, as more detail on the Proposed Development became available during the assessment process, the table of insignificant effects from the EIA Scoping Report has been expanded as impacts from demolition activities and Non-Road Mobile Machinery (NRMM) during the Construction Phase have now also been scoped out.
- 7.3.7. In addition, lack of detail on the proposed on-site energy combustion systems was considered as a limitation for undertaking an assessment of the impacts on local air quality in the EIA Scoping Report. Detailed design of these systems is currently unavailable and as such, an assessment of associated effects has not been undertaken as part of this Air Quality ES Chapter. An assessment has been scoped out on the basis that no Combined Heat and Power (CHP) units are proposed and heating will be provided via air heat pumps from which there are no associated emissions. The energy combustion systems will be supplemented using low Nitrogen Oxide (NO_x) boilers. As such, it is considered that the primary mitigation embedded within these systems will be unlikely to result in a significant effect.

Insignificant Effects

- 7.3.8. The elements shown in **Table 7.2** are not considered to give rise to likely significant effects as a result of the Proposed Development and have therefore not been considered within the ES:

Table 7.2 – Summary of Insignificant Effects

Element scoped out	Justification
Effects on ecological receptors during the Construction Phase	<p>The Ardley Trackways Site of Special Scientific Interest (SSSI) and the Weston Fen SSSI are located approximately 2.7 and 2.8km, north and south west of the Site, respectively.</p> <p>During the Construction Phase, ecological receptors located within 50m of the Site boundary or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance require assessment. Therefore, due to the distance of the nearest ecological receptors to the Proposed Development Site, it is unlikely that the activities during the Construction Phase would give rise to any significant effects at these locations.</p>
Effects on ecological receptors during the Operational Phase	For the Operational Phase, the Ardley Trackways SSSI and the Weston Fen SSSI are not located within 200m of an affected road. Therefore, in line with advice from Natural England (Ref 7.12), further assessment is not required.
Effects on existing sensitive receptor locations from demolition activities	There are currently no buildings on the Site and therefore an assessment of demolition activities on Site has been scoped out.
Effects from Construction Phase NRMM on local air quality	In accordance with the 'IAQM Guidance on the assessment of dust from demolition and construction' (Ref 7.11), all NRMM would need to adhere to the emissions standards for NO ₂ and PM ₁₀ set out for NRMM. It is therefore considered the likely effects of construction plant on local air quality would be not significant and further assessment has been scoped out.

Element scoped out	Justification
Effects from Construction Phase traffic on local air quality	<p>Construction Phase traffic data received from Motion, the appointed Transport Consultants for the Proposed Development indicates that vehicles associated with the Construction Phase will access the Site via the A4095 to the west. The predicted trip generation for the A4095 is 186 Annual Average Daily Trips (AADT) Light Duty Vehicles (LDV) and 130 AADT Heavy Duty Vehicles (HDV) during 2021, which is considered to be 'worst-case' as it predicts that all staff will drive to site.</p> <p>For LDVs, this is below the criteria for development outside of an Air Quality Management Area (AQMA), detailed in the EPUK/IAQM guidance (Ref 7.10), of 500 AADT and therefore the likely effects of additional LDVs during the Construction Phase are not significant and further assessment has been scoped out.</p> <p>For HDVs, the total number of predicted vehicles is above the criteria of 100 AADT outside of an AQMA along the A4095 (West of Site Access) and therefore further consideration on the potential impacts of additional HDVs has been undertaken in Section 7.7 of this ES Chapter.</p>
Effects on existing sensitive receptor locations within the Bicester Air Quality Management Area (AQMA)	Traffic data received from Motion, shows that no vehicles associated with the Proposed Development are predicted to travel through Bicester town centre or through the AQMA. Therefore, in line with the EPUK/IAQM guidance (Ref 7.10), an assessment of potential impacts within the AQMA is not required.
Effects on future and existing sensitive receptor locations at and within the vicinity of the Proposed Development from combustion energy emissions	<p>It has been confirmed by the appointed Mechanical & Electrical Engineers that the Proposed Development will not contain a CHP unit and heating will be generated by air heat pumps with boiler top-up.</p> <p>The closest receptor to the source of energy combustion emissions will be future receptors, i.e. guests of the resort. As such significant primary mitigation will be included to ensure that impacts from energy emissions are controlled such as low NO_x Boilers. As such, an assessment of energy emission impacts on future Site users has been scoped out at this stage.</p> <p>Furthermore with mitigation being employed to reduce emissions as much as possible due to onsite receptors impacts on existing receptors are considered to be not significant and have been scoped out.</p>

7.3.9. As detailed above, as more information for the Proposed Development became available, effects associated with parts of the Construction Phase were considered insignificant and were therefore also scoped out.

7.3.10. The Scoping Opinion and Consultee Responses did not have any comments with regard to the determination of significant and insignificant effects on air quality stated in the Air Quality section of the EIA Scoping Report.

ELEMENTS SCOPED INTO THE ASSESSMENT

Potentially Significant Effects

Construction Phase

7.3.11. The following elements are considered to have the potential to give rise to likely significant effects during construction of the Proposed Development and have therefore been considered within the ES:

- Potential loss of amenity due to dust soiling; and

- The risk of health effects due to significant increase in exposure to PM₁₀.

Operational Phase

7.3.12. The following element is considered to have the potential to give rise to likely significant effects during operation of the Proposed Development and has therefore been considered within the ES:

- Vehicular exhaust emissions associated with the operation of the Proposed Development on existing and proposed sensitive receptor locations.

EXTENT OF THE STUDY AREA

Construction Phase

- 7.3.13. For fugitive dust emissions, human receptors within 350m of the Site boundary or 50m from the construction vehicle route (within an area up to 500m from the Site entrance) have been identified.
- 7.3.14. Impacts have been determined at distance boundaries of 20m, 50m, 100m and 350m for earthworks and construction activities, and at 20m and 50m for trackout activities.
- 7.3.15. A visual representation of these distance buffers is available in **Figure 7.1** for earthworks and construction and **Figure 7.2** for trackout.
- 7.3.16. For construction traffic, the Proposed Development is not located within an AQMA and therefore the EPUK/IAQM criteria (**Ref 7.10**) of an additional 100 AADT HDVs applies.
- 7.3.17. Construction traffic data has been provided by Motion, the appointed Transport Consultants for the Proposed Development, for a construction year of 2021 for the following roads:
- The B430;
 - The M40; and
 - The A4095 (West of Site Access).
- 7.3.18. The traffic data for each of these roads includes both LDV and HDV trips and shows that during the Construction Phase, the predicted LDV and HDV trip generation is below the EPUK/IAQM criteria (**Ref 7.10**) along the B430 and the M40 and the predicted LDV trip generations is below the criteria along the A4095 (West of Site Access). Therefore, potential impacts do not need to be considered further within this assessment. However, the predicted HDV trip generation for the A4095 (west of the Site access) is above the EPUK/IAQM criteria (**Ref 7.10**) of 100 AADT HDV outside of an AQMA with 130 AADT HDV predicted along this route. Therefore, potential impacts along this section of the road have been considered.

Operational Phase

- 7.3.19. The determination of roads for use in the air quality assessment has been based on the criteria detailed within the EPUK/ IAQM guidance (**Ref 7.10**) which states that for developments outside of an AQMA, an increase of 500 AADT LDV or an increase of 100 AADT HDV will apply. Following a review of the traffic data provided by Motion, for the future year Operational Phase assessment, the following roads have been included:
- The B430;
 - The M40;
 - The A4095;
 - Vendee Drive; and
 - The A41.



- 7.3.20. Visual representations of the modelling extents for the future year operational assessment are available in **Figure 7.3**.
- 7.3.21. Worst-case receptor locations within 200m of the roads above have been identified in line with DMRB guidance (**Ref 7.13**), and include the existing Bicester Hotel, Golf and Spa Resort, along with residential properties in Chesterton, Wendlebury and Bicester.

METHOD OF BASELINE DATA COLLATION

Desk Study

- 7.3.22. A baseline air quality review was undertaken to determine the existing air quality in the vicinity of the Site.
- 7.3.23. This desk-top study was undertaken using the following sources:
- Air quality data for Cherwell, including a review of the Cherwell District Council air quality reports and local monitoring data;
 - Background pollution maps from Defra's Local Air Quality Management (LAQM) website (**Ref 7.14**).
 - Aerial photography from Google Maps.

Site Visit

- 7.3.24. For the purpose of this assessment, no site visit was required.

ASSESSMENT METHODOLOGY

Construction Phase Dust Impacts

- 7.3.25. The assessment of construction dust impacts has been undertaken in line with the IAQM methodology (**Ref 7.11**). Activities on the proposed construction site have been divided into three types to reflect their different potential impacts. These are:
- Earthworks;
 - Construction; and
 - Trackout.
- 7.3.26. The risk of dust emissions was assessed for each activity with respect to:
- Potential loss of amenity due to dust soiling; and
 - The risk of health effects due to significant increase in exposure to PM₁₀.
- 7.3.27. The first stage of the assessment involves screening to determine whether there are any sensitive receptors within the threshold distances defined by the IAQM. A detailed assessment of the impact of dust from construction sites will be required where:
- A 'human receptor' is located within 50m of the boundary of the Site or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance.
- 7.3.28. The magnitude of dust emission for each activity is determined on the basis of the guidance, indicative thresholds, information available relating to the Proposed Development and expert judgement. The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area. The risk of impact is then used to determine the mitigation requirements.

7.3.29. Descriptors for magnitude of impact and impact significance used in this assessment of Construction Phase dust are reproduced in **Appendix 7.2**.

Construction Phase Vehicular Pollutants

7.3.30. An assessment of road traffic emissions associated with the Construction Phase of the Proposed Development has been undertaken with reference to the EPUK/IAQM (**Ref 7.10**) indicative criteria as detailed below:

- A change of LDV flows of more than 500 AADT (outside an AQMA);
- A change of HDV flows of more than 100 AADT (outside an AQMA);
- A change of LDV flows of more than 100 AADT (within an AQMA); and/or
- A change of HDV flows of more than 25 AADT (within an AQMA).

Operational Phase Impacts

Operational Phase Vehicular Pollutants

7.3.31. The assessment of road traffic has been undertaken with reference to the following documents:

- Defra's LAQM.TG(16) and
- Land-Use Planning and Development Control: Planning for Air Quality (v1.2, 2017) – EPUK and IAQM indicative criteria, i.e.:
 - A change of LDV flows of more than 500 AADT (outside an AQMA);
 - A change of HDV flows of more than 100 AADT (outside an AQMA);
 - A change of LDV flows of more than 100 AADT (within an AQMA); and/or
 - A change of HDV flows of more than 25 AADT (within an AQMA).

7.3.32. Full details of the Operational Phase methodology are provided in **Appendix 7.5**.

7.3.33. Detailed air dispersion modelling has been undertaken using the Cambridge Environmental Research Consultants (CERC) ADMS Roads v4.1 air dispersion model, following guidance provided in LAQM.TG(16) (**Ref 7.5**) to predict annual mean concentrations of NO₂ and PM₁₀ for the various scenarios. The risk of exceedance of the short-term air quality objectives (AQOs) and compliance with 1-hour mean NO₂ and 24-hour mean PM₁₀ AQOs has been assessed following LAQM.TG(16) guidance (**Ref 7.5**).

7.3.34. The risk of exceeding the 1-hour mean AQO has been assessed according to the guidance in LAQM.TG(16) (**Ref 7.5**). This guidance states that:

“authorities may assume that exceedances of the 1-hour mean objective for NO₂ are only likely to occur where annual mean concentrations are 60µg/m³ or above”.

7.3.35. The risk of exceeding the 24-hour mean AQO has been assessed according to the guidance in LAQM.TG(16) (**Ref 7.5**). This guidance provides the calculation below to determine compliance:

“No. 24-hour mean exceedances = -18.5 + 0.00145 × annual mean + (206/annual mean)”.

7.3.36. For the Operational Phase, the following scenarios have been modelled:

- 2018 Base Year;
- 2022 Opening Year Do-Minimum (DM) (predicted traffic flows in 2022 should the Proposed Development not proceed); and



- 2022 Opening Year Do-Something (DS) (predicted traffic flows in 2022 should the Proposed Development be completed, with the addition of traffic generated by the Site).

- 7.3.37. It should be noted that both the DM and DS scenario also include development flows from Committed Developments agreed with the LPA and detailed in **Chapter 14: Cumulative Effects**.
- 7.3.38. Vehicle emissions have been calculated based on vehicle flow, fleet composition and speed using Defra's Emission Factor Toolkit (v9.0) (EFT).
- 7.3.39. Full details of the modelling methodology and model input parameters are provided in **Appendix 7.3**.

SIGNIFICANCE CRITERIA

- 7.3.40. The assessment of potential effects as a result of the Proposed Development has taken into account both the Construction and Operational Phases. The Construction Phase includes enabling works, earthworks and construction activities as set out in **Chapter 4: The Proposed Development**.
- 7.3.41. The significance level attributed to each effect has been assessed based on the magnitude of change due to the Proposed Development and the sensitivity of the affected receptor, as well as a number of other factors that are outlined in more detail in **Chapter 2: Approach to the Assessment**. The sensitivity of the affected receptor is assessed on a scale of high, medium, low and negligible, and the magnitude of change is assessed on a scale of high, medium, low and negligible (as shown in **Chapter 2: Approach to the Assessment**).
- 7.3.42. For the Construction Phase, the assessment using the approach in the IAQM document (**Ref 7.11**) is designed to identify the appropriate level of mitigation commensurate with the risk identified. The methodology does not allow for the significance of the unmitigated effect to be defined.
- 7.3.43. For the Operational Phase, there is no official guidance in the UK on how to assess the significance of the air quality effects of new developments however, the approach suggested by EPUK and the IAQM guidance on 'Land-Use Planning & Development Control: Planning for Air Quality' (**Ref 7.10**) has been used for the existing human receptors. This provides a method for identifying the impact descriptor for each receptor (see **Table 7.3**) based on the impact and the development concentration, expressed as a percentage of the AQO.
- 7.3.44. It is recommended that the AQOs are the annual mean objectives.
- 7.3.45. To determine the overall significance of the effects of a Proposed Development professional judgement is also required. A number of factors are considered including the air quality with and without the Proposed Development, the extent of current and future exposure, the assumptions adopted in the prediction of the impacts as well as the impact descriptors for the individual receptors.

Table 7.3 – EPUK/IAQM Impact Descriptors for Individual Receptors

Long Term Average Concentration at Receptor Location	% Change in Concentration relative to Air Quality Assessment Level (AQO)			
	1	2-5	6-10	>10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76-94% of AQO	Negligible	Slight	Moderate	Moderate
95-102% of AQO	Slight	Moderate	Moderate	Substantial
103-109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

EFFECT SIGNIFICANCE

7.3.46. The following terms have been used to define the significance of the effects identified and apply to both beneficial and adverse effects:

- **Major effect:** where the Proposed Development could be expected to have a very noticeable effect (either beneficial or adverse) on receptors; [i.e. locations where members of the public are likely to be regularly present such as residential properties, hospitals and schools].
- **Moderate effect:** where the Proposed Development could be expected to have a noticeable effect (either beneficial or adverse) on receptors;
- **Minor effect:** where the Proposed Development could be expected to result in a small, barely noticeable effect (either beneficial or adverse) on receptors; and
- **Negligible:** where no discernible effect is expected as a result of the Proposed Development on receptors.

7.3.47. In relation to the EPUK and IAQM guidance detailed in **Table 7.3**, **substantial** impacts would be considered as a **major effect**, **moderate** impacts as a **moderate effect**, **slight** impacts as a **minor effect** and **negligible** impacts would be considered as a **negligible effect**.

7.3.48. As set out in **Chapter 2: Approach to the Assessment**, effects that are classified as **major or moderate** (either beneficial or adverse) are considered to be **significant**. Effects classified as **minor or negligible** are considered to be **not significant**.

7.4. BASELINE CONDITIONS

7.4.1. Baseline air quality refers to existing concentrations of pollutants present in ambient air.

CHERWELL DISTRICT COUNCIL REVIEW AND ASSESSMENT

7.4.2. A review of the most recent air quality Annual Status Report indicates that there are currently four AQMAs declared for exceedances of the annual mean NO₂ objective across Cherwell District Council's area of administration. The Site is not currently located within an AQMA with the closest



AQMA being approximately 2.7km to the north east (AQMA 4 – sections of Kings End, Queens Avenue, Field Street and St Johns Street).

LOCAL AIR QUALITY MONITORING

- 7.4.3. Cherwell District Council do not currently undertake any continuous monitoring within their area of administration. However, monitoring of nitrogen dioxide (NO₂) is undertaken using passive diffusion tubes at 45 locations across the district. Concentrations of NO₂ from the closest monitoring locations within 5km of the Proposed Development are provided in **Table 7.4**.

Table 7.4 – Passive Diffusion Tube Monitoring Locations

Site ID	Type	Distance from Site (km)	Grid Reference		Annual Mean NO ₂ Concentration (µg/m ³)				
			X	Y	2014	2015	2016	2017	2018
Middleton Stoney	Kerbside	2.0	453397	223516	34.1	32.4	33.3	33.6	33.1
Shakespeare Drive	Roadside	2.5	456937	223586	-	-	23.2	24.0	23.4
Villiers Road	Urban Background	2.5	457619	222535	18.3	16.9	18.2	17.9	17.2
Kings End South	Roadside	2.8	458006	222404	46.9	46.0	46.0	41.7	41.9
Queens Avenue	Kerbside	2.8	458539	222381	40.3	38.7	38.7	39.5	35.1
Howes Lane	Roadside	3.7	457956	224362	23.4	23.9	25.6	25.6	24.5

- 7.4.4. As shown in **Table 7.4**, there were no exceedances of the annual mean objective for NO₂ of 40µg/m³ at the majority of the passive diffusion tube locations within 5km of the Site in recent years. However, the NO₂ annual mean has been exceeded at Kings End South every year between 2014 and 2018. This is however expected due its roadside location within AQMA 4.

DEFRA PREDICTED CONCENTRATIONS

- 7.4.5. Background concentrations have been obtained from the national maps published by Defra (**Ref 7.14**). These estimated concentrations are produced on a 1km by 1km grid basis for the whole of the UK.
- 7.4.6. Predicted background concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5} for the grid square within Bicester town centre where the passive diffusion tubes are located have been obtained for use in the verification process of modelling results. The concentrations for 2018, the most recent year with available monitoring data are detailed in **Table 7.5**.

Table 7.5 – Predicted Background Concentrations within Bicester

Grid Reference (m)	Predicted Background Concentration in 2018 ($\mu\text{g}/\text{m}^3$)			
	NO _x	NO ₂	PM ₁₀	PM _{2.5}
X 458500, Y 222500	18.1	13.1	15.2	10.3

7.4.7. In addition to the predicted background concentrations in Bicester town centre, background concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5} have been obtained for grid squares within the modelling extents, including the Proposed Development which is located in National Grid Reference (NGR): X 454500, Y 221500. The predicted background concentrations for 2018 are detailed in **Table 7.6**.

Table 7.6 – Predicted Background Concentrations within the Modelling Extents

Grid Reference (m)	Predicted Background Concentration in 2018 ($\mu\text{g}/\text{m}^3$)			
	NO _x	NO ₂	PM ₁₀	PM _{2.5}
X 454500, Y 221500	23.1	16.4	17.1	10.5
X 455500, Y 221500	17.0	12.4	15.0	9.7
X 454500, Y 222500	23.3	16.5	17.2	10.5
X 453500, Y 223500	14.1	10.4	14.6	9.3
X 455500, Y 219500	28.8	19.8	17.3	10.8
X 457500, Y 220500	16.0	11.7	15.4	9.5
X 457500, Y 221500	17.5	12.7	16.2	10.0
X 453500, Y 222500	13.9	10.3	14.8	9.3
X 456500, Y 219500	18.2	13.2	15.1	9.8

7.4.8. As shown in **Tables 7.5** and **7.6**, predicted background concentrations are well below the relevant air quality objectives for all pollutants in 2018.

SUMMARY OF BACKGROUND DATA

- 7.4.9. There were no exceedances of the air quality objectives at the majority of the passive diffusion tube monitoring locations in the vicinity of the Site in recent years. However, concentrations monitored at the Kings End South passive diffusion tube location, located approximately 2.8km from the Site has exceeded the air quality objective of 40 $\mu\text{g}/\text{m}^3$ each year from 2014 to 2018. This is however expected due to its roadside location within AQMA 4.
- 7.4.10. The overall trend in monitoring results show that NO₂ concentrations have been decreasing over the last 5 years at all of the monitoring locations in the vicinity of the Site.
- 7.4.11. With regards to monitored background concentrations, the closest urban background monitoring location is approximately 2.5km from the Site at Villiers Road, Bicester. When comparing the monitored NO₂ concentration at this urban background location in 2018 to the background



concentrations predicted by Defra for 2018 at the Site, these are similar, with the Villiers Road diffusion tube monitoring $17.2\mu\text{g}/\text{m}^3$ and Defra predicting an NO_2 concentration of $16.4\mu\text{g}/\text{m}^3$.

- 7.4.12. Background concentrations also predicted by Defra for the 1km by 1km grid squares in Bicester including AQMA 4, are well below the relevant air quality objectives. Comparison with the passive diffusion tube monitoring results indicates the impact that vehicle exhaust emissions from the highway network have on pollutant concentrations at kerbside and roadside locations.

FUTURE BASELINE

- 7.4.13. Predicted background concentrations for 2022, the anticipated opening year for the Proposed Development have also been obtained from the national maps published by Defra. Predicted concentrations for the Site and grid squares within the future year modelling extents for NO_2 , PM_{10} and $\text{PM}_{2.5}$ are provided in **Table 7.7**.

Table 7.7 – Future Year Background Concentrations

Grid Reference (m)	Predicted Background Concentrations in 2022 ($\mu\text{g}/\text{m}^3$)			
	NO_x	NO_2	PM_{10}	$\text{PM}_{2.5}$
X 454500, Y 221500	18.3	13.3	16.4	9.9
X 455500, Y 221500	13.9	10.3	14.3	9.1
X 454500, Y 222500	18.4	13.4	16.5	9.9
X 453500, Y 223500	11.7	8.8	13.9	8.7
X 455500, Y 219500	22.5	16.1	16.5	10.2
X 455000, Y 220500	13.2	9.9	14.7	8.9
X 457500, Y 221500	14.2	10.5	15.5	9.4
X 453500, Y 222500	11.6	8.7	13.9	8.7
X 456500, Y 219500	14.8	11.0	14.4	9.2

- 7.4.14. As shown in **Table 7.7**, background concentrations are predicted to decrease in the future when comparing these to the predicted background concentrations in 2018 shown in **Tables 7.5** and **7.6**. A decrease in background concentrations in the future may lead to an overall decrease in pollutant concentrations over time, however there is still some uncertainty around these predictions. Therefore, in order to provide a robust assessment, 2018 baseline background concentrations have been used over future baseline background concentrations.

SENSITIVE RECEPTORS

- 7.4.15. For the Construction Phase assessment, the IAQM guidance (**Ref 7.11**) advises that a construction dust assessment is required if there are human receptors within 350m of the boundary of the Site or within 50m of construction vehicle routes. A desk-top review of the Site location identified human receptors within 350m of the site boundary. A Construction Phase assessment is therefore required to assess the impacts on human receptor locations.
- 7.4.16. For the Operational Phase, there are a number of residential properties in the vicinity of the Site which are detailed in **Table 7.8**.

Table 7.8: Operational Phase Sensitive Receptor Locations

ID	Receptor	Grid Reference (m)		Height (m)
		X	Y	
R1	Residential – A4095	455878	221965	1.5
R2	Residential – A4095	455811	221787	1.5
R3	Residential – A4095	455784	221715	1.5
R4	Residential – A4095	455755	221659	1.5
R5	Residential – A4095	455723	221664	1.5
R6	Residential – Unnamed Road	455764	221616	1.5
R7	Residential – A4095	455529	221676	1.5
R8	Residential – A4095	454290	222124	1.5
R9	Residential – Church Lane	455881	219723	1.5
R10	Residential – Caravan Park	457062	220871	1.5
R11	Hotel – Premier Inn Bicester	457574	221719	1.5
R12	Residential – A4095	455835	221895	1.5
R13	Residential – A4095	455841	221816	1.5
R14	Residential – A4095	455801	221680	1.5
R15	Residential – Unnamed Road	455718	221463	1.5
R16	Residential – Unnamed Road	455281	221634	1.5
R17	Residential – A4095	455806	221745	1.5
R18	Residential – A4095	455799	221730	1.5
R19	Residential – A4095	455784	221700	1.5
R20	Residential – A4095	455816	221715	1.5

ID	Receptor	Grid Reference (m)		Height (m)
		X	Y	
R21	Residential – A4095	455785	221640	1.5
R22	Residential – A4095	455773	221683	1.5
R23	Residential – Unnamed Road	455306	221673	1.5
R24	Bicester Hotel, Golf and Spa	455178	221551	1.5
R25	Bicester Hotel, Golf and Spa Grounds	454971	221366	1.5
R26	Bicester Hotel, Golf and Spa Grounds	454823	221399	1.5
R27	Bicester Hotel, Golf and Spa Grounds	454833	221522	1.5
R28	Bicester Hotel, Golf and Spa Grounds	454790	221645	1.5
R29	Residential – Bicester Park Homes	456997	220815	1.5
R30	Residential – Haydock Road	457545	221666	1.5
PR1	Proposed Sensitive Receptor	454975	221764	1.5
PR2	Proposed Sensitive Receptor	455070	221645	1.5
PR3	Proposed Sensitive Receptor	454839	221565	1.5

7.4.17. It should be noted that the sensitive receptor locations identified above are considered to be worst-case locations in terms of sensitivity to poor air quality. However, this is not an exhaustive list and there may be other locations within the vicinity of the Site which may experience air quality impacts as a result of the Proposed Development that have not been individually assessed. The receptor locations assessed are closest to the affected roads and would therefore be expected to experience the greatest change in pollutant concentration as a result of the operation of the Proposed Development.

7.4.18. All key sensitive receptor locations are shown on **Figure 1.4**.

7.5. RELEVANT ELEMENTS OF THE PROPOSED DEVELOPMENT AND ESTABLISHING THE PRE-MITIGATION SCENARIO

CONSTRUCTION PHASE

- 7.5.1. During the Construction Phase it is understood that a new access road will be created to access the Site and will remain in place following the completion of Proposed Development and will serve as the permanent entrance to the resort. There are currently two route options for entering the Site, both of which avoid HDVs travelling through any villages in the surrounding area. This diversion of HDV traffic associated with the Site assists in reducing the exposure of dust and vehicle pollution to sensitive receptor locations in the vicinity of the Proposed Development. A Construction Management Plan has been produced as part of the Planning Application submission which contains suggested methods for the appointed contractor to reduce impacts on air quality including the management of dust and the minimisation of on-site energy consumption.

OPERATIONAL PHASE

- 7.5.2. It has been confirmed by Motion that 10% of all parking spaces at the Proposed Development will have EV charging facilities to promote sustainable travel.
- 7.5.3. With the construction of the new entrance to the resort, there will be two routes which visitors can use to access the Proposed Development (from the west and from the east). The predicted trip generation calculated using the traffic data provided by Motion indicates that more traffic is predicted to enter the Site from the west, meaning the majority of traffic will not travel through the village of Chesterton. This diversion of traffic generated by the Proposed Development will assist in reducing potential effects associated with road traffic emissions at sensitive receptor locations in the vicinity of the Proposed Development.

7.6. ASSESSMENT OF EFFECTS, MITIGATION AND RESIDUAL EFFECTS

- 7.6.1. A Construction Phase impact assessment has been undertaken to assess the potential risk of dust soiling and human health impacts associated with earthworks, construction activities and trackout, and is detailed in **Appendix 7.4**.

CONSTRUCTION PHASE

Element of topic under consideration	Earthworks An assessment of the potential risks associated with earthworks activities at the Proposed Development was undertaken and impacts on dust soiling and human health were considered to be 'Low Risk', however the inclusion of primary mitigation measures, as detailed in the Construction Management Plan, will likely reduce this risk to 'Negligible'.
Secondary Mitigation	No additional mitigation required in line with IAQM document 'Guidance on the assessment of dust from demolition and construction' (Ref 7.11).
Residual effects and monitoring	Negligible (not significant).

Element of topic under consideration	Construction
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	An assessment of the potential risk associated with construction activities at the Proposed Development was undertaken and impacts on dust soiling and human health were considered to be 'Low Risk'.
Secondary Mitigation	<ul style="list-style-type: none"> ▪ Avoid scabbling; and ▪ Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless it is required for a particular process, in which case ensure that appropriate additional control measures are in place. <p>In line with IAQM document 'Guidance on the assessment of dust from demolition and construction' (Ref 7.11).</p>
Residual effects and monitoring	Negligible (not significant).

Element of topic under consideration	<p>Trackout</p> <p>An assessment of the potential risk associated with trackout from the Proposed Development was undertaken and impacts on dust soiling and human health were considered to be 'Low Risk'.</p>
Secondary Mitigation	<ul style="list-style-type: none"> ▪ Use water-assisted dust sweeper on the access and local roads; ▪ Avoid dry sweeping of large areas; ▪ Ensure vehicles entering and leaving sites are covered to prevent escape of materials; and ▪ Implement a wheel washing system at a suitable location near site exit. <p>In line with IAQM document 'Guidance on the assessment of dust from demolition and construction' (Ref 7.11).</p>
Residual effects and monitoring	Negligible (not significant).

Element of topic under consideration	<p>Construction Phase Traffic Impacts</p> <p>Traffic data provided by Motion shows a predicted increase in HDVs of 130 AADT along the A4095 (West of Site Access) during the Construction Phase of the Proposed Development which is above the criteria detailed in the EPUK/IAQM guidance (Ref 7.10). However, it should be noted that there is only one sensitive receptor location within 200m of the A4095 (West of Site Access).</p> <p>A review of the baseline background concentrations within the 1km by 1km grid square defined by Defra indicates that background NO₂ concentrations in 2018 are below the air quality objective of 40µg/m³ at 16.5µg/m³ i.e. 41% of the AQO. Therefore, due to the temporary and short term nature of Construction Phase impacts it is not anticipated that the additional 30 HDVs above the EPUK/IAQM criteria will lead to significant impacts as it is unlikely that the additional vehicles will cause an increase in NO₂ concentrations equivalent to, or above 59% of the air quality objective at a setback distance from the road of 15m, where the closest residential property is located.</p>
Secondary Mitigation	No additional mitigation required.
Residual effects and monitoring	Negligible (not significant).

OPERATIONAL PHASE

- 7.6.2. An Operational Phase impact assessment has been undertaken to assess the impacts of the Proposed Development on the existing sensitive receptors detailed in Table 7.8. The full assessment can be seen in **Appendix 7.5**.

<p>Impacts on Sensitive Receptor Locations</p>	<p>Predicted annual mean NO₂ concentrations are below the AQO of 40µg/m³ in both the DM and DS scenario for 2022 at the 25 receptors considered in the assessment where the annual mean objective applies i.e. existing residential properties.</p> <p>Of these 25 receptors, the magnitude of impacts on annual mean NO₂ concentrations, in line with the EPUK/IAQM guidance (Ref 7.10), as a result of the Proposed Development was predicted to be negligible at 16 receptor locations and slight at 9 receptor locations. It should however be noted that where slight impacts are predicted, annual mean NO₂ concentrations remain below the AQO of 40µg/m³ with the Proposed Development in place.</p> <p>Other locations, representative of the grounds of the existing Bicester Hotel, Golf and Spa resort, were also considered as sensitive receptors within the modelling. In line with LAQM.TG(16) (Ref 7.5), these outdoor areas where public exposure is expected to be short term i.e. a golf course are comparable to the 1-hour mean for short term exposure.</p> <p>The methodology within LAQM.TG(16) (Ref 7.5) states that “exceedances of the 1-hour mean are unlikely to occur where the annual mean is below 60µg/m³.” The maximum annual NO₂ concentration predicted at receptors representative of Bicester Hotel, Golf and Spa grounds in the DS scenario is 68.7µg/m³. This is above the indicative criteria of 60µg/m³, however NO₂ concentrations in the DM scenario were also predicted to be 68.7µg/m³. Therefore, traffic associated with the Proposed Development does not lead to an exceedance of the hourly mean for NO₂.</p> <p>Predicted annual mean PM₁₀ concentrations did not exceed the AQO of 40µg/m³ at any of the sensitive receptor locations considered and impacts at all of the sensitive receptor locations were considered to be negligible, in line with the EPUK/IAQM guidance (Ref 7.10).</p> <p>Predicted annual mean PM_{2.5} concentrations did not exceed the air quality objective of 25µg/m³ at any of the sensitive receptor locations considered and impacts at all of the sensitive receptor locations were considered to be negligible, in line with the EPUK/IAQM guidance (Ref 7.10).</p> <p>The sensitivity of residential receptors is considered to be high, and the magnitude of change prior to mitigation, is considered to be negligible to slight adverse. Therefore, there is likely to be a direct, permanent, long-term negligible to minor adverse effect on existing residential receptors in the vicinity of the Proposed Development (significant) prior to the implementation of mitigation measures.</p> <p>Further details of the Operational Phase assessment are included in Appendix 7.5.</p>
<p>Secondary Mitigation</p>	<p>In order to reduce impacts along the A4095 through the village of Chesterton, it is recommended that a Framework Travel Plan be secured and implemented as part of the Proposed Development.</p>
<p>Residual effects and monitoring</p>	<p>Negligible (not significant).</p>



SITE SUITABILITY

- 7.6.3. In line with LAQM.TG(16) (**Ref 7.5**), the 1-hour mean for NO₂ and the 24-hour mean for PM₁₀ AQOs apply to the Proposed Development. As such, this section considers the 1-hour mean and 24-hour mean pollutant concentrations at the Site.
- 7.6.4. Three sensitive receptor locations have been identified using the Proposed Site Arrangement Plan by EPR Architects (Ref: 10875-EPR-ZZ-XX-DR-A-01-0201) and represent areas of the Proposed Development where the hotel and the waterpark are proposed.
- 7.6.5. The methodology within LAQM.TG(16) (**Ref 7.5**) states that “exceedances of the 1-hour mean are unlikely to occur where the annual mean is below 60µg/m³.” The maximum annual mean NO₂ concentration predicted at the Proposed Development in the DS scenario is 49.7µg/m³. As this is below the indicative criteria of 60µg/m³, exceedances of the 1-hour mean are considered unlikely.
- 7.6.6. NO₂ concentrations at the Proposed Development are therefore considered to be in compliance with the 1-hour mean AQO.
- 7.6.7. Annual mean PM₁₀ concentrations with the development in place showed a maximum predicted PM₁₀ concentration of 21.3µg/m³. This equates to 5 days where 24-hour mean PM₁₀ concentrations are greater than 50µg/m³. Thirty-five 24-hour periods where concentrations are in excess of 50µg/m³ are permitted and therefore, the number of maximum exceedances is in compliance with the 24-hour mean AQO.
- 7.6.8. The Site is therefore considered to be suitable for the proposed end-use.

7.7. LIMITATIONS AND ASSUMPTIONS

- 7.7.1. There are a number of assumptions and limitations associated with the completion of the Construction Phase and Operational Phase assessments for the Proposed Development. These are detailed below.

Construction Phase

- 7.7.2. Potential effects during the Construction Phase are dependent on a number of factors including weather conditions during specific construction works. This cannot be predicted when undertaking the construction phase assessment and therefore the IAQM methodology (**Ref 7.11**) uses a risk based approach to identify appropriate mitigation measures. The assessment, whilst adopting some conservative assumptions, assumes that the mitigation measures will be fully implemented.

Operational Phase

- 7.7.3. All air pollution dispersion models have limitations due to:
- The difficulty in parameterising complex atmospheric processes; and
 - Input data such as traffic flows and emission factors.
- 7.7.4. The weather conditions at the Brize Norton weather station are considered to be similar to those in Bicester and the meteorological data for 2018 is considered to be representative of the conditions in 2022, when the Proposed Development is anticipated to be completed.
- 7.7.5. The Brize Norton weather station lies just over 30 km to the south west of Bicester. There are no major physical features likely to have a significant impact on the weather conditions between Brize Norton and Bicester and therefore using data from this weather station is acceptable.

- 7.7.6. It is not possible to forecast future weather conditions with accuracy several years into the future, and therefore assuming that weather conditions remain the same as the base year is the only reasonable option available.
- 7.7.7. To minimise uncertainty in the ADMS-Roads model, results for 2022 have been verified against 2018 air quality monitoring data, and the model adjusted accordingly (model verification).
- 7.7.8. There is uncertainty regarding future NO_x emissions from light duty diesel vehicles. Under real world driving conditions, emissions of NO_x from diesel vehicles, have remained virtually unchanged over many years despite a series of increasingly stringent emission limits being mandated. There is good evidence, however, that the most recent generation of vehicles have, on average, lower emissions than their predecessors and therefore it is likely that emissions will decline, although this may not be as fast as Defra's current projections, as embedded in the EFT used in this the assessment. Therefore, a more conservative emission scenario has been modelled with no improvement from 2018.
- 7.7.9. For the model inputs, it has been assumed that there are no street canyons restricting dispersion of traffic emissions on the roads modelled and that the average speeds provided by Motion are representative of those in the real world.
- 7.7.10. When processing the results from the model, it has been assumed that Defra's NO_x to NO₂ calculator (v7.1) has accurately predicted NO₂ concentrations in Cherwell.

It has been assumed that primary mitigation relating to energy emissions from the Proposed Development will suffice in ensuring that impacts on local air quality will be not significant.

7.8. SUMMARY

- 7.8.1. This Chapter details the potential air quality impacts associated with the construction and operation of the Proposed Development.
- 7.8.2. The Site is not located within or near to an AQMA and predicted background concentrations at the Proposed Development are well below the air quality objective of 40µg/m³. There are currently no automatic monitoring stations or passive diffusion tube monitoring locations within the vicinity of the Site, however NO₂ concentrations outside of the Bicester AQMA are also below the air quality objective of 40µg/m³.
- 7.8.3. The residual effects during the Construction Phase of the Proposed Development on dust soiling and human health are predicted to be low risk for earthworks, construction activities and trackout following the implementation of pre-mitigation techniques detailed in Section 7.6. As a result, secondary mitigation measures have been recommended in line with the IAQM document 'Guidance on the assessment of dust from demolition and construction' (**Ref 7.11**).
- 7.8.4. The residual effects during the Operational Phase are predicted to be negligible following the implementation of a Framework Travel Plan to ensure that existing residential properties along the A4095 through the village of Chesterton are protected from elevated NO₂ concentrations associated with traffic travelling to and from the Proposed Development.
- 7.8.5. A summary of the effects on air quality as a result of the Proposed Development is detailed in **Table 7.9** below.



Table 7.9 - Summary of Effects Table for Air Quality

Description of Effects	Receptor	Significance and Nature of Effects Prior to Mitigation / Enhancement	Summary of Mitigation / Enhancement	Significance and Nature of Effects Following Mitigation / Enhancement (Residual)
Construction Phase				
Earthworks	Existing sensitive receptors	Low risk - / T / D / ST	<ul style="list-style-type: none"> No additional mitigation required in line with IAQM document 'Guidance on the assessment of dust from demolition and construction'. 	Negligible
Construction	Existing sensitive receptors	Low risk - / T / D / ST	<ul style="list-style-type: none"> Avoid scabbling; and Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless it is required for a particular process, in which case ensure that appropriate additional control measures are in place. 	Negligible (not significant)
Trackout	Existing sensitive receptors.	Low risk - / T / D / ST	<ul style="list-style-type: none"> Use water-assisted dust sweeper on the access and local roads; Avoid dry sweeping of large areas; Ensure vehicles entering and leaving sites are covered to prevent escape of materials; and Implement a wheel washing system at a suitable location near site exit. 	Negligible (not significant)

Construction Traffic	Existing sensitive receptors		<ul style="list-style-type: none"> No additional mitigation required. 	Negligible (not significant)
Operational Phase				
Road traffic emissions	Existing sensitive receptors	Negligible to minor (not significant) - / P / D / LT	<ul style="list-style-type: none"> Inclusion of a Framework Travel Plan for the scheme. 	Negligible (not significant)

NB: Aspects of the Proposed Development considered as part of the pre-mitigation scenario are summarised above in Section 7.5.

Key to table:

+ / - = Beneficial or Adverse P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term N/A = Not Applicable

7.9. REFERENCES

- **Ref 7.1:** Defra (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Defra.
- **Ref 7.2:** The Stationary Office (2000) Statutory Instrument 2000, No 921, The Air Quality (England) Regulations 2000, London.
- **Ref 7.3:** The Stationary Office (2002) Statutory Instrument 2002, No 304, The Air Quality (England) (Amendment) Regulations 2002, London.
- **Ref 7.4:** The Stationary Office (2010) Statutory Instrument 2010, No 1001, The Air Quality Standards Regulations 2010, London.
- **Ref 7.5:** Defra (2018) Local Air Quality Management Technical Guidance (TG16) – [online] Available: <https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf>
- **Ref 7.6:** Defra (2019) The Clean Air Strategy.
- **Ref 7.7:** Cherwell District Council, Cherwell Local Plan 2011-2031 – [online] Available: <https://www.cherwell.gov.uk/info/83/local-plans/376/adopted-cherwell-local-plan-2011-2031-part-1>
- **Ref 7.8:** Ministry of Housing, Communities & Local Government (2019) National Planning Policy Framework – [online] Available: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>
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- **Ref 7.10:** Environmental Protection UK and Institute of Air Quality Management (v1.2 2017), Land-Use Planning & Development Control: Planning For Air Quality – [online] Available: <http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>
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- **Ref 7.13:** Design Manual for Roads and Bridges (DMRB) Section 11, Section 3, Part 1 HA207/07 - [online] Available: <http://www.standardsforhighways.co.uk/ha/standards/dmr/vol11/section3/ha20707.pdf>
- **Ref 7.14:** Defra (2017) Background Pollution Maps – [online], Available: <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>
- **Ref 7.15:** Environment Agency (2018) Pollution Inventory – [online], Available: <https://data.gov.uk/dataset/cfd94301-a2f2-48a2-9915-e477ca6d8b7e/pollution-inventory>

FIGURES



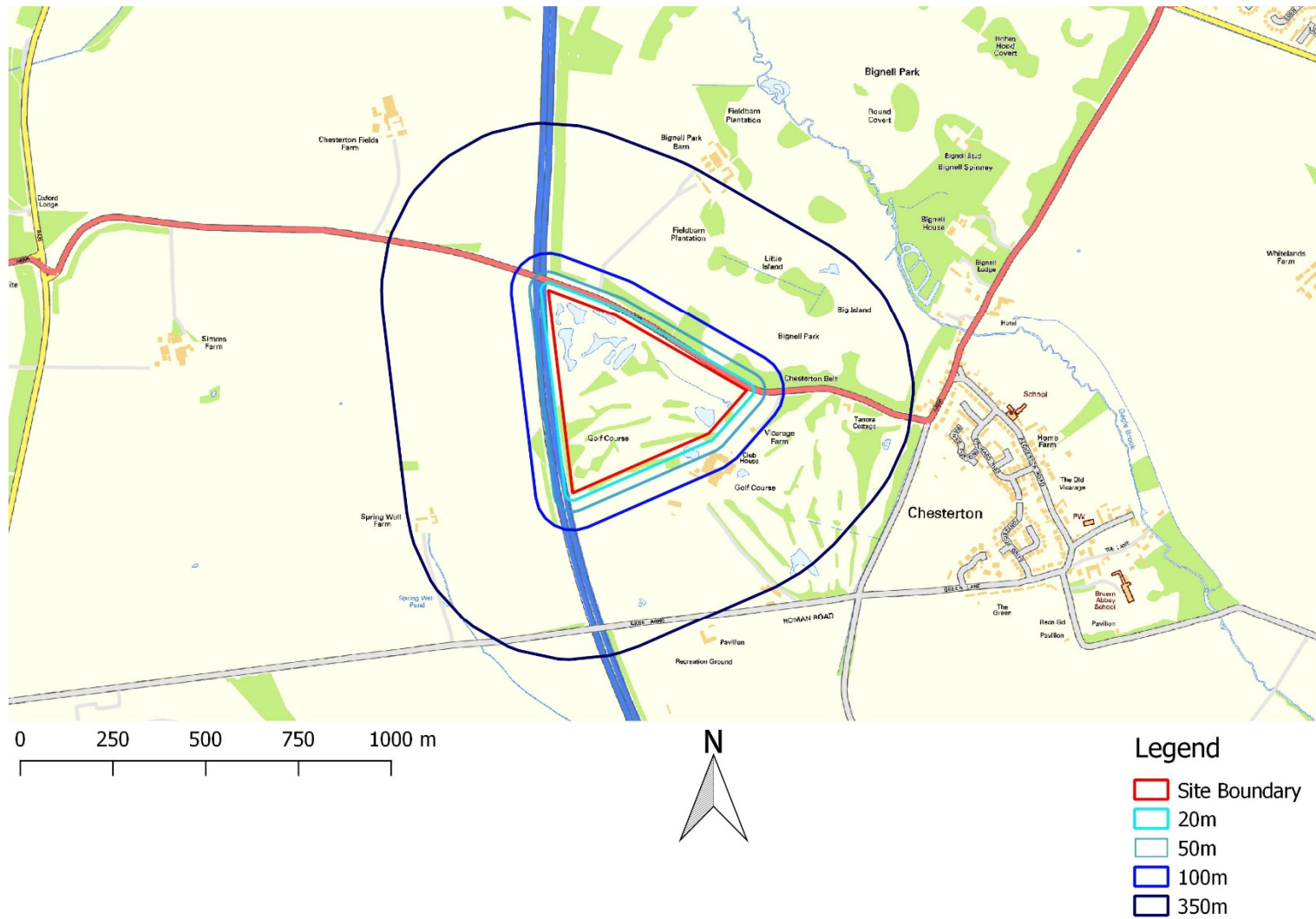


Figure 7.1: Earthworks and Construction Dust Buffers. Contains OS Data © Crown Copyright and Database rights 2019.

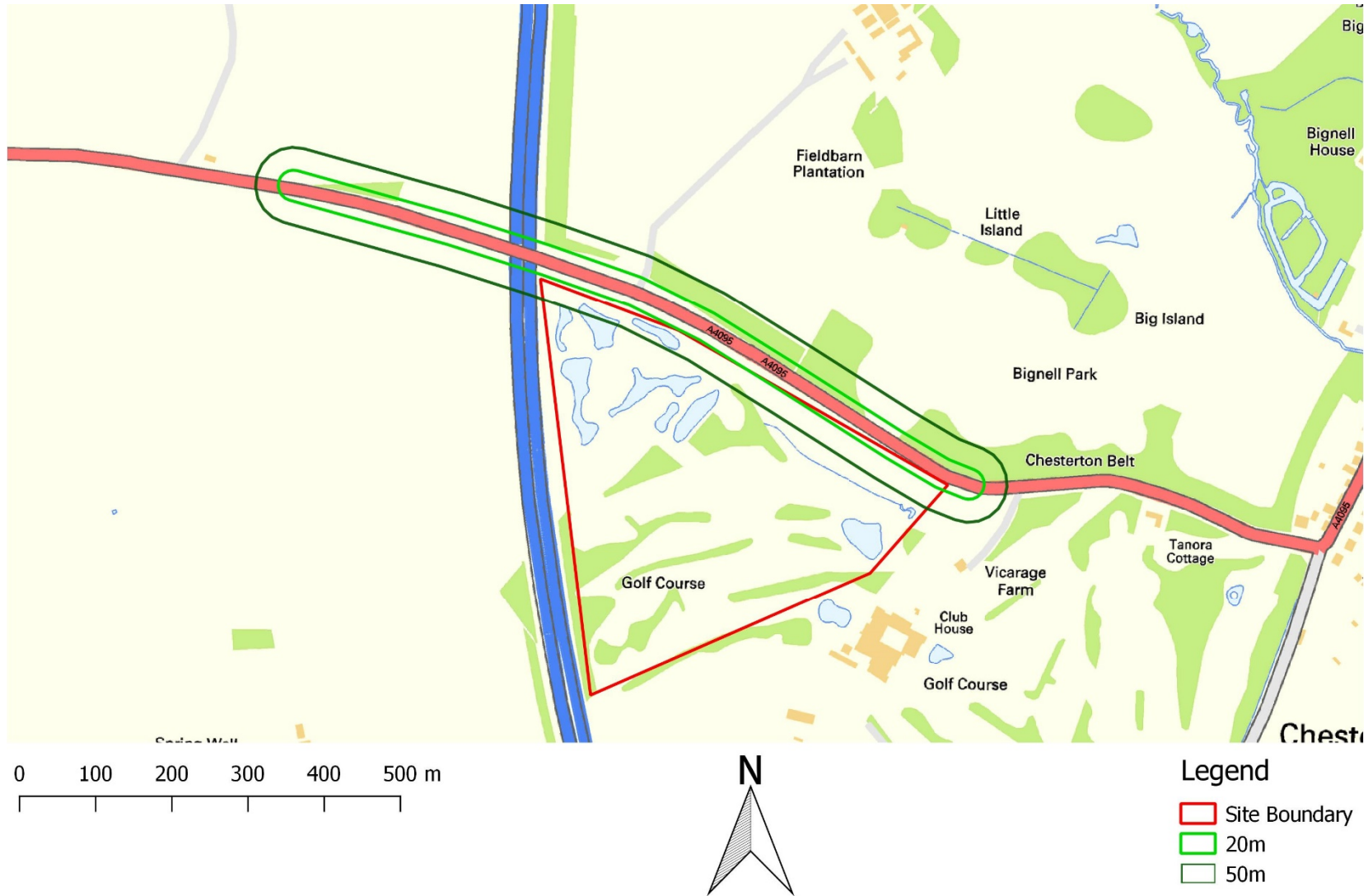
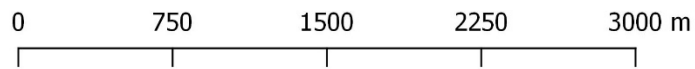
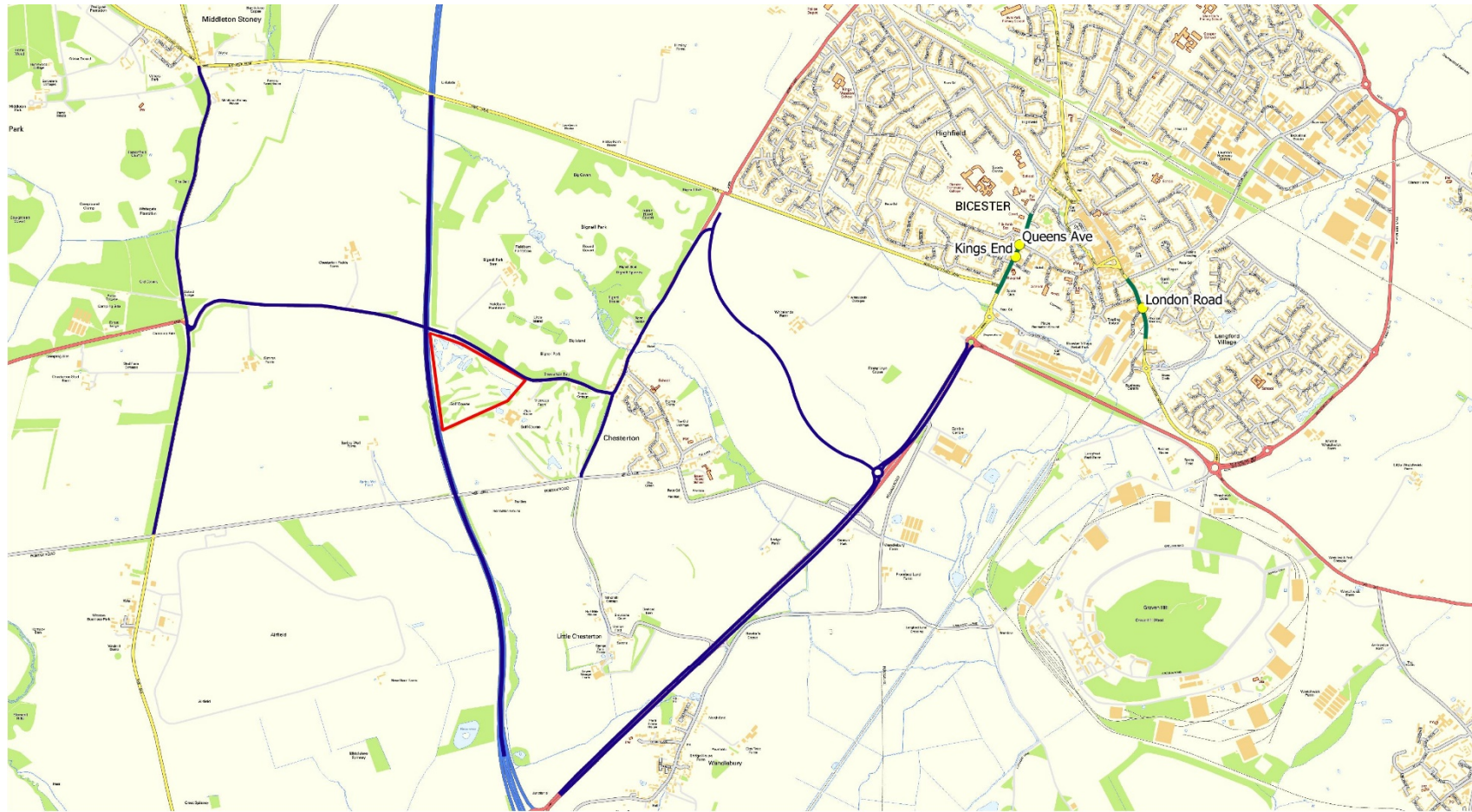


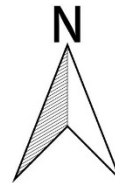
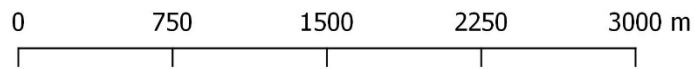
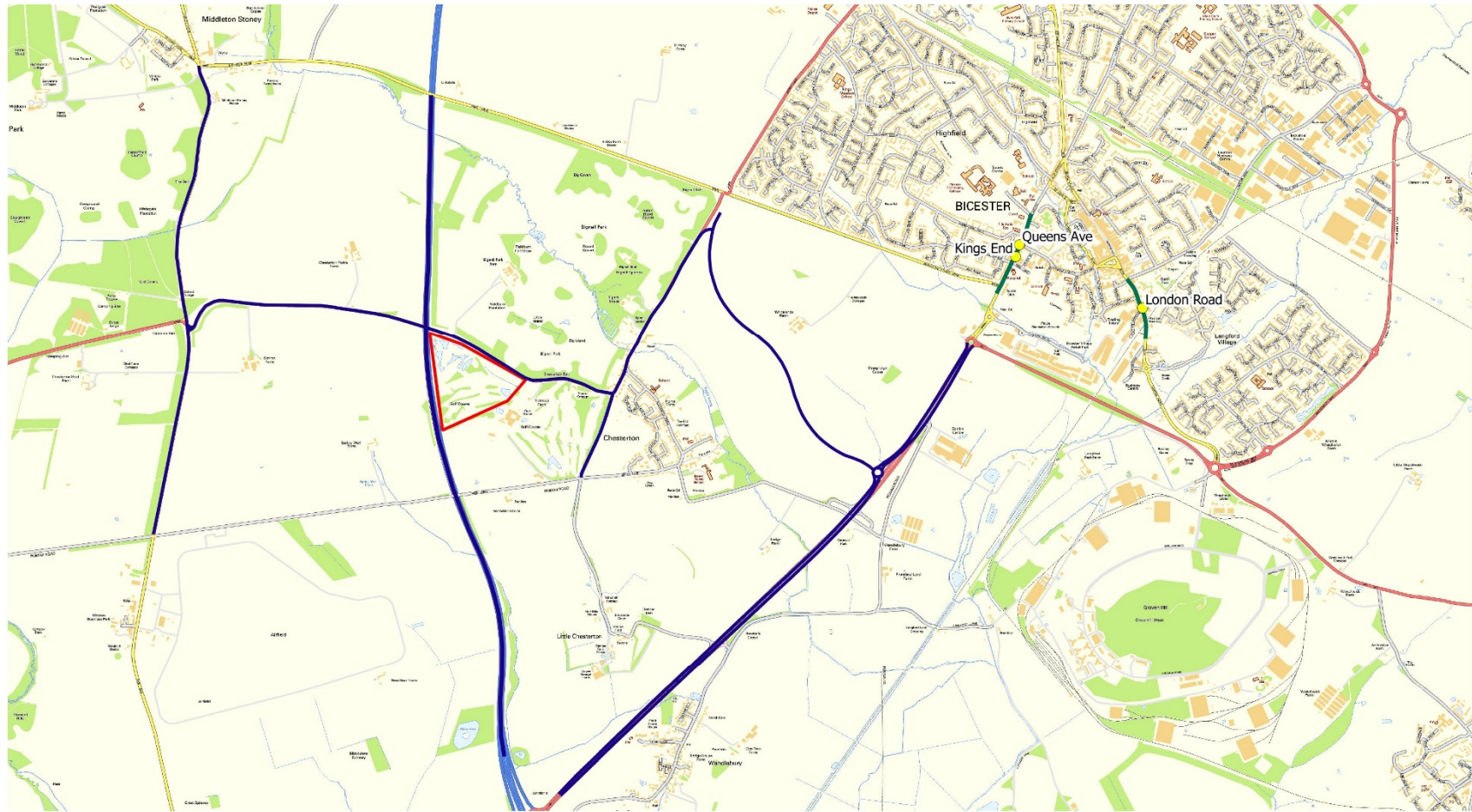
Figure 7.2: Trackout Dust Buffer. Contains OS Data © Crown Copyright and Database rights 2019.



Legend

- Site Boundary
- Verification Roads
- Future Year Roads
- Diffusion Tube

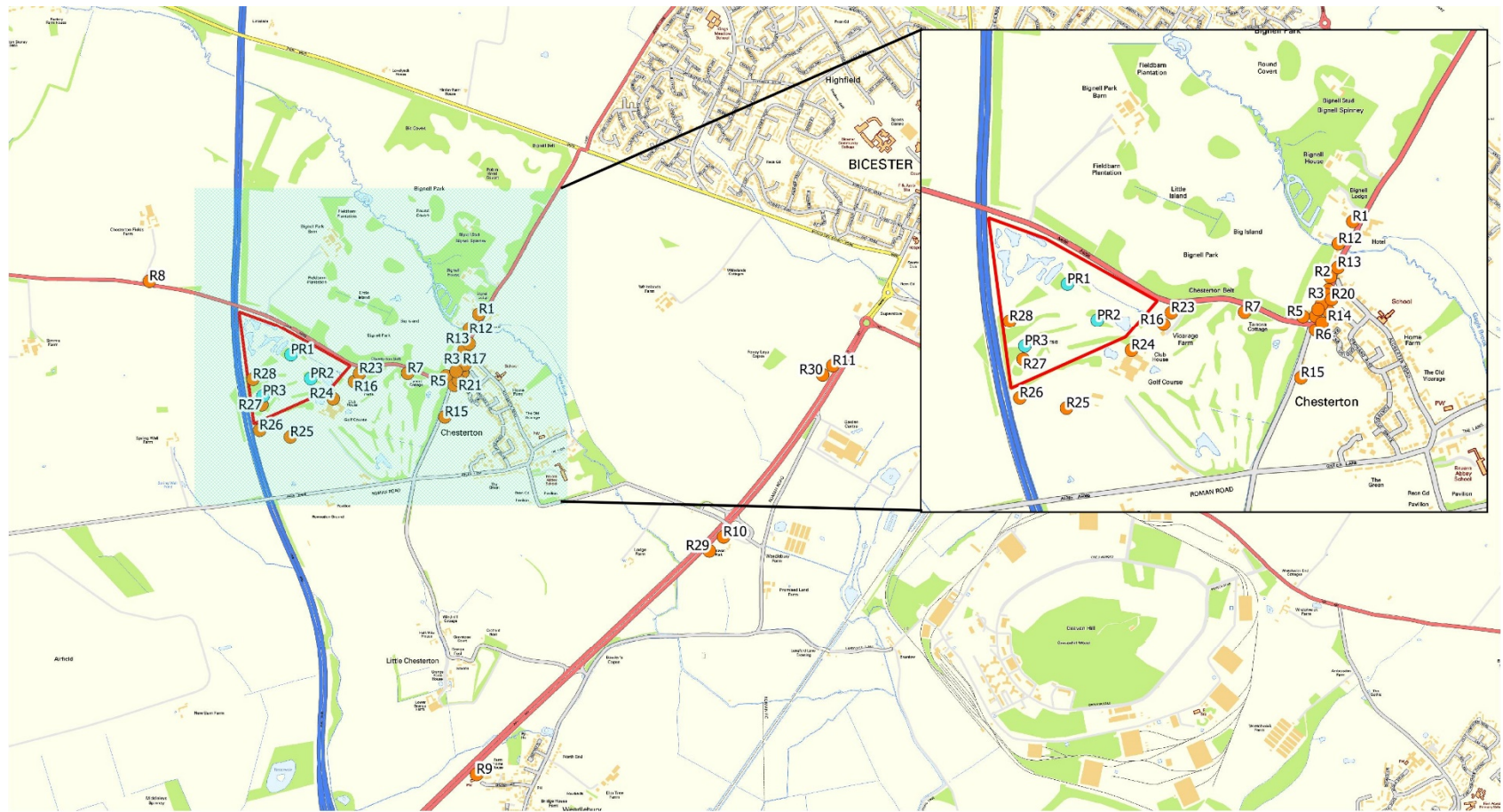
Figure 7.3: Modelling Extents. Contains OS Data © Crown Copyright and Database rights 2019.



Legend

- ▭ Site Boundary
- Verification Roads
- Future Year Roads
- Diffusion Tube

Figure 7.3: Modelling Extents. Contains OS Data © Crown Copyright and Database rights 2019.



0 250 500 750 1000 m



Legend

- Site Boundary
- Existing Sensitive Receptors
- Proposed Sensitive Receptors

Figure 7.4: Sensitive Receptor Locations. Contains OS Data © Crown Copyright and Database rights 2019.