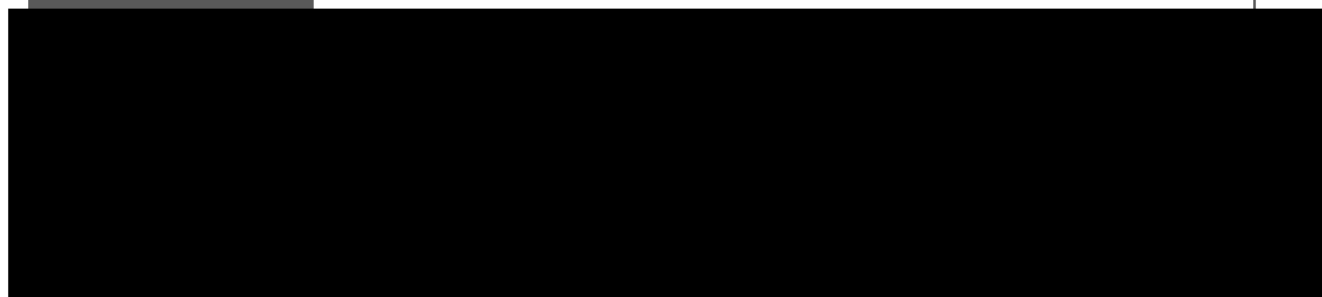


LAND AT BRIDGE ROAD, IMPINGTON

TECHNICAL NOTE

Project	Land at Bridge Road, Impington
---------	--------------------------------



Executive Summary

Main Points for consideration	Required	Further Details
Is air quality a significant constraint?	No	No exceedances of the current annual mean air quality objectives for England were predicted.
Are there masterplan considerations?	No	Pollutant concentrations across the Site were predicted to be below the current relevant air quality objectives for England.
Is mitigation likely to be required?	No	No mitigation is required at the Site to protect future occupants from pollutant concentrations. However, impacts as a result of fugitive dust emissions during the construction phase and road traffic emissions associated with the proposed development off Site during the operational phase have not been considered within the feasibility study. As such, a detailed air quality assessment is recommended at planning stage to determine the requirement for mitigation measures during the construction and operational phases of the proposed development.
Is further work required at feasibility stage?	No	N/A
Is further work required to accompany the planning submission?	Yes	Detailed air quality assessment to determine the potential impacts of the proposed development on existing receptors within the vicinity of the Site during both the construction phase and operational phase.

1.0 Introduction

- 1.1 BWB Consulting Ltd was appointed by BDW Trading Limited to undertake a Site suitability assessment, with regard to air quality, to assist with promotion of the Site at land at Bridge Road, Impington. It is understood that the intended site use is to provide a predominantly residential scheme which includes outdoor sports provision, play spaces, allotments and an orchard and local shops/retail.

2.0 The Site

- 2.1 The Site is located within the administrative area of South Cambridgeshire District Council (SCDC). The Site is not currently located within an existing Air Quality Management Area (AQMA).
- 2.2 The Site currently comprises greenfield land on the edge of an existing residential area. To the north of the Site is Busway NCN51 with Histon Football Club and agricultural land beyond. The Busway NCN51 continues to the east of the Site. Chivers Lake is also located adjacent to Site to the east with the A14 located beyond. To the south of the Site is Chivers Lake and the Holiday Inn Cambridge hotel grounds. The A14 is also located approximately 200m south of the Site at the closest point. To the immediate west of the Site is an existing residential property with Bridge Road located beyond.

3.0 Baseline Conditions

Local Air Quality Management

- 3.1 The Site is not located within an existing AQMA and the closest AQMA is located approximately 2km south and was declared by the neighbouring administrative area of Cambridge City Council for potential exceedances of the annual mean air quality objective for nitrogen dioxide (NO₂).

Local Air Quality Monitoring

Nitrogen Dioxide

- 3.2 SCDC undertakes monitoring of NO₂ within its administrative area using both passive and continuous methods. There are a number of monitoring locations within the proximity of the Site with the closest monitoring location, DT1 an urban background location, approximately 170m to the west of the Site. The closest roadside monitoring location is DT20, approximately 240m south of the Site. A review of monitoring data at all monitoring locations within the vicinity of the Site were below the current annual mean air quality objective of 40µg.m⁻³ for NO₂ following a review of available and representative data between 2015 and 2022. At the time of assessment 2020 and 2021 monitoring data were available and therefore were included in the review. The IAQM released a position statement¹ in August 2021 with regard to 2020 and 2021 monitoring datasets. Due to the influence of the COVID-19 pandemic lockdown restrictions, 2020 and 2021 monitoring data are not considered representative of normal conditions. 2022 data were available and included in the review. As the IAQM has not released a position

¹ Institute of Air Quality Management (2021) Position Statement: Use of 2020 and 2021 Monitoring Datasets

statement in relation to 2022 monitoring data, 2022 was considered representative of normal conditions.

- 3.3 The majority of roadside monitoring locations in the vicinity of the Site are located more than 15m from the A14, which is considered to be the main source of pollutant emissions in the area. In accordance with Defra's Local Air Quality Management (LAQM) Technical Guidance (TG22)², monitoring locations more than 15m from the road cannot be considered as roadside monitoring locations for use in air dispersion model verification process. There is one roadside diffusion tube (DT14) located approximately 1km north west of the Site along the B1049 Water Lane which is a roadside location. Despite the distance, it is considered to be representative of the Site which is also located adjacent to the B1049. Annual mean NO₂ concentrations from diffusion tube DT14 were utilised for use in the verification process.

Particulate Matter

- 3.4 SCDC also undertake monitoring of particulate matter (PM₁₀ and PM_{2.5}) within its administrative area via continuous monitoring. The closest automatic monitoring station is IMP, located approximately 800m south west of the Site. A review of PM₁₀ and PM_{2.5} of available and representative monitoring data (2015 – 2022) indicated that annual mean concentrations were below the current relevant air quality objectives of 40µg.m⁻³ for PM₁₀ and 20µg.m⁻³ for PM_{2.5} respectively. In addition, PM_{2.5} monitoring data were below the interim air quality objective of 12µg.m⁻³, to be achieved by 2028, between 2015 and 2022 with the exception of 2021. The future PM_{2.5} air quality objective of 10µg.m⁻³, to be achieved by 2040, was exceeded in all years between 2015 and 2021 however monitored concentrations in 2022 were below the future year objective.

Background Concentrations

- 3.5 There are a number of monitoring locations within the vicinity of the Site which measure background NO₂ concentrations; the closest of which is DT1 located approximately 170m west of the Site. Monitored NO₂ background concentrations were below the current annual mean air quality objective of 40µg.m⁻³ at all background monitoring sites in the last five years of available data (2018 – 2022).
- 3.6 DT1 is considered to be representative of background concentrations at the Site due its close proximity and similar distance from the A14 as the Site. Monitored NO₂ background concentrations at this location were therefore utilised in the assessment to provide background NO₂ concentrations.
- 3.7 No monitoring of background PM₁₀ or PM_{2.5} is currently undertaken in the vicinity of the Site. Therefore, background PM₁₀ and PM_{2.5} concentrations for the 1km by 1km grid squares which cover the Site and study area were obtained from Defra's 2018-based background concentration maps³ for use in the modelling assessment works.

² Defra (2022) Local Air Quality Management Technical Guidance LAQM.TG(22)

³ Defra (2018) background pollutant concentration maps [<https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>]

4.0 Assessment Methodology

Air Dispersion Modelling

- 4.1 The air dispersion model ADMS-Roads, version 5.1.0.3 was utilised in the assessment to predict concentrations of nitrogen oxides (NO_x), PM₁₀ and PM_{2.5} across the Site for a 2019 Verification and Base Year.
- 4.2 Traffic data were obtained from the Department for Transport website⁴ for the following roads:
- A14 (east of Histon junction);
 - A14 (west of Histon junction); and
 - Cambridge Road.
- 4.3 Traffic data were not available for Bridge Road and therefore proxy flows from Cambridge Road were utilised in the absence of any other available data.
- 4.4 Traffic flows for 2019 and 2022 were obtained for the A14, east and west of Histon junction, however the latest available data set available for Cambridge Road were from 2019. A review of the total number of vehicles on the A14 in 2019 and in 2022 indicated that traffic flows were higher in 2022 than 2019. As such, a hybrid approach was taken whereby pollutant concentrations were predicted for a 2019 Verification and Base Year using 2022 traffic data for the A14 but using 2019 traffic data for Cambridge Road and Bridge Road.
- 4.5 Emission factors and background concentrations for 2019 were also used in the assessment. This is considered to be a conservative approach as emission factors and background concentrations are both higher in 2019 than in 2022 and higher volumes of traffic, representative of 2022, have been used.

Receptor Locations

- 4.6 Pollutant concentrations were predicted across the Site to consider exposure of future residents of the proposed development to local air quality. A Cartesian grid from minimum X 544144, Y 261662 to maximum X 545148, Y 262529, modelled at a height of 1.5m, was included to predict pollutant concentrations across the Site to consider its suitability for the proposed sensitive end use.

Assessment Criteria

- 4.7 Predicted pollutant concentrations were compared to the relevant air quality objectives for England. The current relevant air quality standards and objectives are detailed in **Table 4.1**.

⁴ Department for Transport (2024) Road Traffic Statistics [<https://roadtraffic.dft.gov.uk/#6/55.254/-2.582/basemap-regions-countpoints>]

Table 4.1: Air Quality Standards and Objectives (England)

Pollutant	Averaging Period	Air Quality Objective ($\mu\text{g.m}^{-3}$)	Date to Achieve by
NO ₂	Annual Mean	40	31 December 2005
	1-hour mean not to be exceeded more than 18 times per year	200	31 December 2005
PM ₁₀	Annual Mean	40	31 December 2004
	24-hour mean not to be exceeded more than 35 times per year	50	31 December 2004
PM _{2.5}	Annual Mean	20	1 January 2020
	<i>Annual mean interim target as detailed within the Environmental Improvement Plan⁵</i>	12	31 January 2028
	<i>Annual mean</i>	10	31 December 2040

Italics denotes future air quality objectives published by the UK Government

5.0 Site Suitability Assessment

- 5.1 Concentrations of NO₂, PM₁₀ and PM_{2.5} were predicted across the Site for the assessment year of 2019. Predicted pollutant concentrations are detailed in **Figure A.1** to **Figure A.3** in **Appendix A**.
- 5.2 The predicted NO₂, PM₁₀ and PM_{2.5} concentrations in 2019 indicate that pollutant concentrations at the Site are well below the respective current air quality objectives for England detailed in **Table 4.1**. Furthermore, predicted PM_{2.5} concentrations across the Site are below both the interim and future air quality objectives of 12 $\mu\text{g.m}^{-3}$ and 10 $\mu\text{g.m}^{-3}$, respectively.
- 5.3 With regard to short term air quality objectives for NO₂ and PM₁₀ at the Site, the predicted annual mean NO₂ concentrations are less than 60 $\mu\text{g.m}^{-3}$ and therefore in accordance with Defra guidance² it may be assumed that exceedance of the 1-hour mean NO₂ objective of 200 $\mu\text{g.m}^{-3}$ are unlikely. The calculation detailed in Defra guidance² was used to determine potential exceedance of the 24-hour PM₁₀ short term objective; no exceedances were predicted.
- 5.4 The assessment was undertaken utilising 2019 background concentrations and 2019 emission factors. This was considered to provide a conservative assessment of potential air quality constraints as background concentrations and emission factors are predicted to decrease in the future. As such, it is likely that background concentrations and emission factors will be lower during the opening year of the proposed development

⁵ Defra (2023) Environmental Improvement Plan 2023, First revision of the 25 Year Environment Plan

meaning that pollutant concentrations across the Site are likely to be lower than those predicted in this assessment.

6.0 *Likely Mitigation and Further Assessment Work*

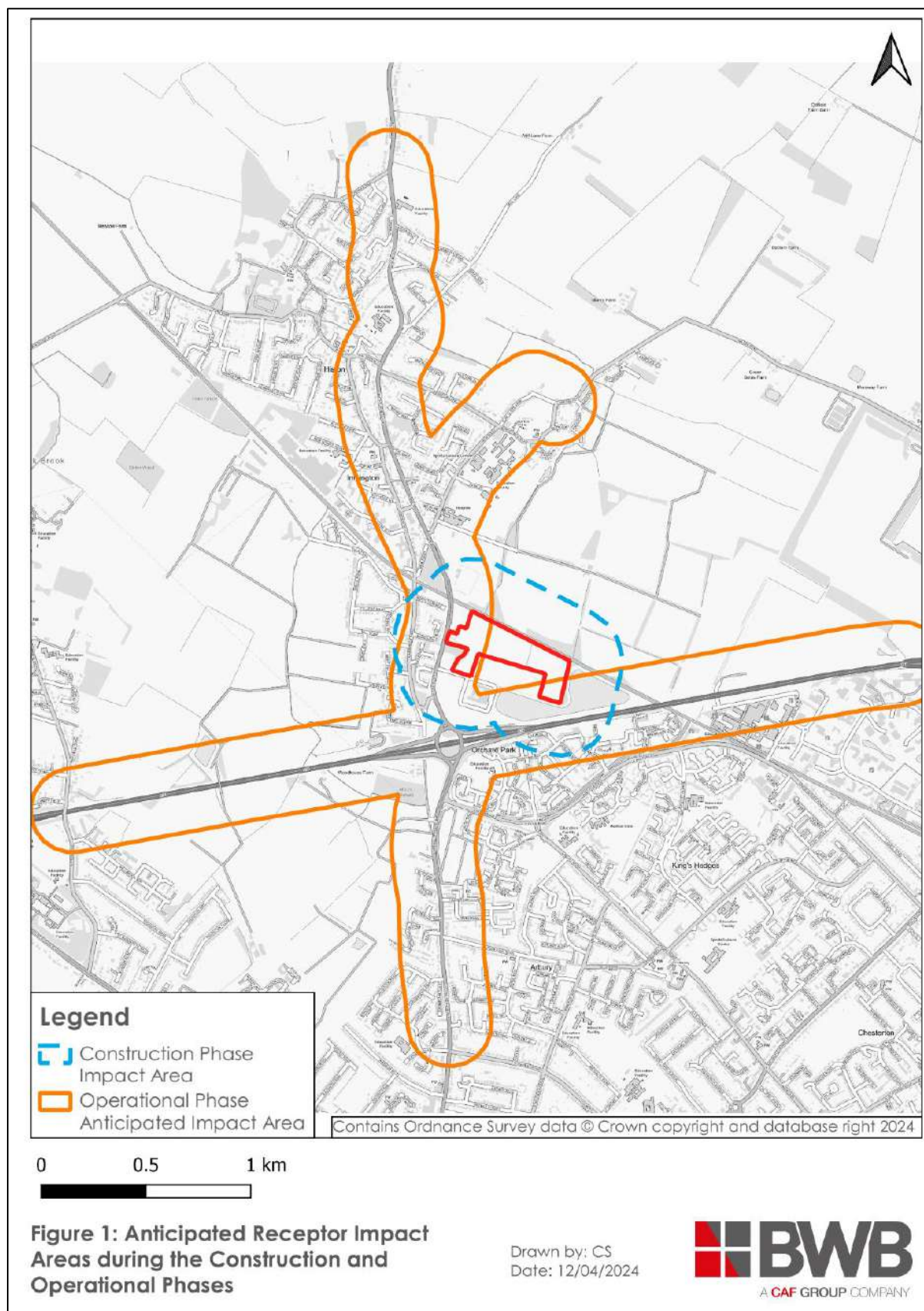
Mitigation Measures

- 6.1 Based on the assessment results, pollutant concentrations across the Site are predicted to be below the current relevant air quality objectives for England and therefore the Site is considered to be suitable for the proposed end use with regard to air quality without the inclusion of any mitigation measures.
- 6.2 This assessment however does not consider the potential impacts of fugitive dust emissions during the construction phase or the impact of additional road traffic emissions associated with increased traffic generation as a result of the proposals. Mitigation measures will be required during the construction phase due to the proximity of existing sensitive receptors in the vicinity of the Site. A detailed air quality impact assessment will be required to assess the potential impacts of road traffic emissions associated with the proposed development and to determine the requirement for mitigation measures off Site.

Further Assessment Work

- 6.3 A detailed air quality assessment to assess impacts on local air quality during the construction phase and operational phase will be required to support any planning application for the Site, in line with relevant guidance. Figure 1 below indicate the areas where receptor locations are anticipated to include in both the construction phase and operational phase. The assessment would include consultation with SCDC to agree the proposed methodology and model inputs. Mitigation measures would be recommended for both the construction phase and operational phase, where required.

Figure 1: Anticipated Receptor Areas during the Construction and Operational Phases



7.0 Summary

- 7.1 A review of baseline air quality in the vicinity of the Site indicates that monitored pollutant concentrations, undertaken by SCDC in the vicinity of the Site, are below the current relevant air quality objectives for NO₂, PM₁₀ and PM_{2.5}.
- 7.2 Pollutant concentrations were predicted across the Site using conservative model inputs and were predicted to be below the current relevant air quality objectives for England. Furthermore, PM_{2.5} concentrations were predicted to be below both the interim and future air quality objectives to come into effect in 2028 and 2040, respectively.
- 7.3 Based on the assessment results, the Site is considered suitable for the proposed residential end use without the requirement for mitigation measures to protect future users from elevated pollutant concentrations.
- 7.4 It is recommended that as part of any planning application, a detailed air quality assessment is undertaken to consider the impacts on existing receptors in the vicinity of the Site during both the construction and operational phases of the proposed development. Mitigation measures during the construction phase and operational phase should be provided where necessary.

Appendix A

Figure A.1 - Predicted Annual Mean NO₂ Concentrations Across the Site



Figure A.2 - Predicted Annual Mean PM₁₀ Concentrations Across the Site

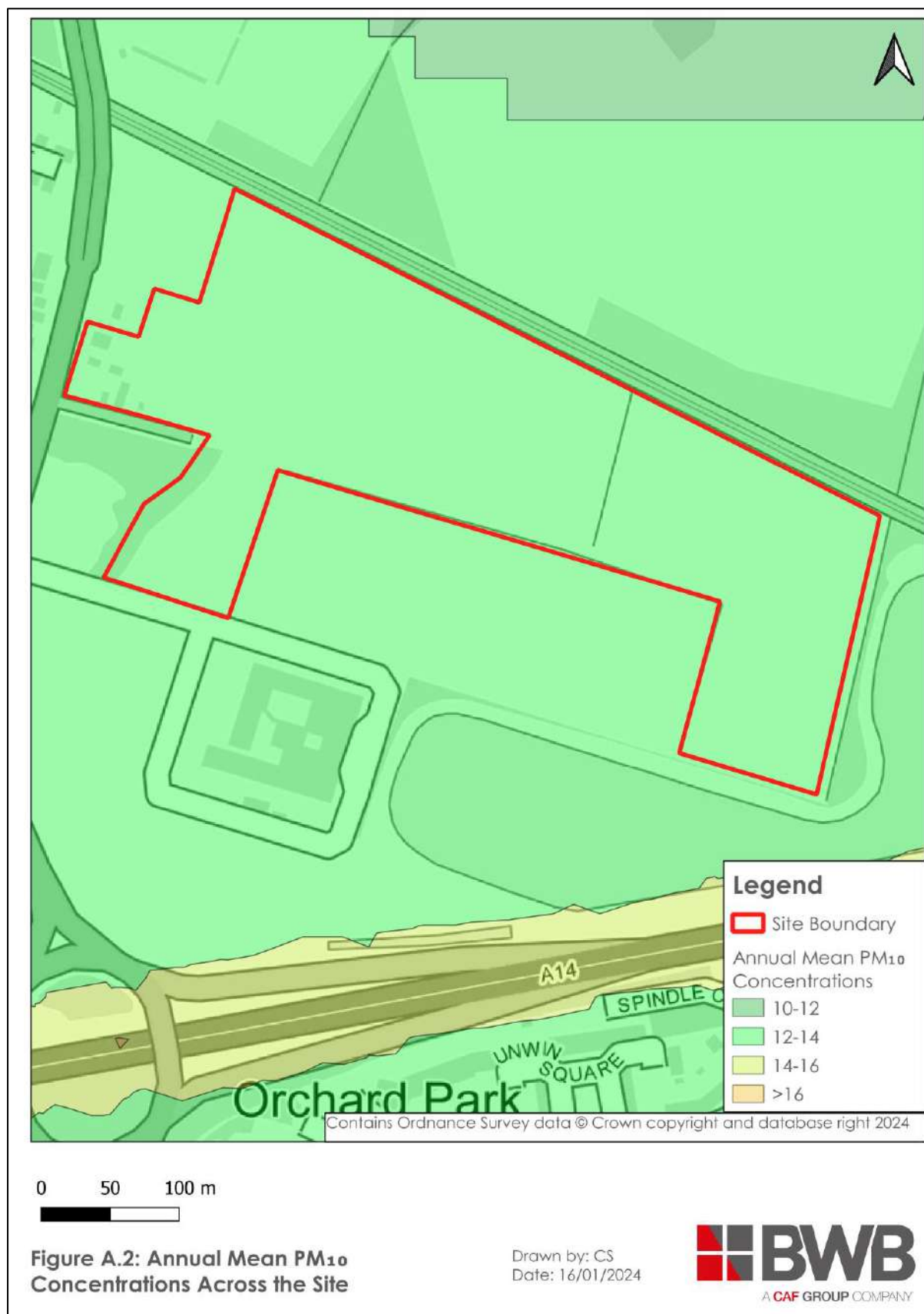


Figure A.3 - Predicted Annual Mean PM_{2.5} Concentrations Across the Site

