

11. AIR QUALITY

11.1. INTRODUCTION

Company

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Chapter Purpose

This chapter of the ES assesses the likely significant effects of the proposed development on the environment in terms of Air Quality. The chapter and its supporting appendices describe the planning policy context, the assessment methodology; the baseline conditions at the application site and surroundings; the likely significant effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; the likely residual effects after these measures have been employed; and the cumulative effects. In summary, the objectives of the chapter are to:

- Assess the potential effect of the development on local air quality during construction and on completion; and
- Consider the impacts of the emissions from construction activities and the operational development on existing sensitive receptors and proposed receptors on the site

Figures

- Figure 11.1: Receptor Locations and Site Boundary
- Figure 11.2 Construction Phase Assessment Bands

Appendices

- Appendix 11.1: Fort Halstead Air Quality Assessment

11.2. METHODOLOGY

Guidance

This assessment has been undertaken using the following guidance documents;

- UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations, 2017. [1]
- Planning Practice Guidance, 2014 [2]
- Environmental Protection UK & Institute of Air Quality Management Guidance; Land-use Planning and Development Control: Planning for Air Quality 2017 [3]

Legislation and Policy

This assessment has been undertaken using the following legislation and policy documents;

- Air Quality Standards Regulations, 2010 [4]
- The UK Air Quality Strategy, 2007 [5]
- The Environment Act, 1995 [6]
- National Planning Policy Framework, 2019 [7]
- Sevenoaks District Council, Core Strategy Development Plan Document, 2011 [8]
- Kent Downs Area of Outstanding Natural Beauty Management Plan, 2014 [9]

Consultees

No consultations outside the EIA scoping exercise have been undertaken in regard to this chapter.

Scoping

A summary of the comments received in the Scoping Report and where they have been addressed in the ES are presented in Table 11.1.

Table 11.1

Summary of comments received during scoping

CONSULTEE COMMENT	HOW ADDRESSED IN ES CHAPTER
Comprehensive contaminated land assessments and air quality assessments will be required to show the presence of potential adverse conditions and appropriate mitigation measures where necessary	A comprehensive air quality assessment has been undertaken and presented within this ES chapter and in Appendix 11.1. Appropriate mitigation measures have been recommended where necessary.
The site is in close proximity to the M25 which is an Air Quality Management Area.	The air quality assessment has included traffic flows on the M25. See Appendix 11.1.
The inclusion of air quality within the Environmental Statement is welcome and the Council's Environmental Health department have raised no objections to the proposed content.	Not Applicable

Within the scoping report it was proposed that an assessment of impacts of operational energy plant would be included. It has subsequently been confirmed that there are no emission generating elements to the energy strategy and therefore this part of the assessment has been scoped out.

Consideration of Climate Change

Climate change is not considered relevant to this assessment and, as such, has not been considered further. Wider consideration of climate change in the context of the proposed development is provided at Appendix 2.4, Vol III of this ES.

Consideration of Human Health

The consideration of effects on human health is integral to the assessment of air quality effects reported in the chapter. The thresholds that have been used to categorise potential effects are based on guidance criteria (e.g. EPUK and IAQM) that have been specifically established for the protection of human health. Wider consideration of human health in the context of the proposed development may be found at Appendix 2.5, Vol II of this ES.

Consideration of Risk of Major Accidents and/or Disasters

Risk of major accidents and/or disasters are not considered relevant to this assessment. Wider consideration of the risk of major accidents and disasters in the context of the proposed development may be found at Appendix 2.6, Vol III of this ES.

Alternatives

No alternatives are considered relevant to this assessment.

Assessment of Baseline Conditions & Receptor Sensitivity

The air quality assessment was undertaken using a variety of information and procedures as follows:

- Review of SDC's air quality Review and Assessment statutory reports published as part of the LAQM regime to determine baseline conditions around the site;
- Review of the local area to identify potentially sensitive receptor locations that could be affected by changes in air quality arising from the construction works and the operation of the development;
- Review and use of traffic flow data supplied by Peter Brett Associates (PBA);
- Dispersion modelling of pollutant emissions using the ADMS-Roads [10] model to predict the likely pollutant concentrations at the Site in terms of traffic emissions generated. The NO₂ from NO_x Calculator [11] available from the LAQM Support website has been applied to derive the road-related NO₂ concentrations from the modelled NO_x concentrations;
- Comparison of the predicted air pollutant concentrations with monitored concentrations from three urban background diffusion tubes located within the site, set up by Waterman for a monitoring study and the adjustment of modelled results where necessary;
- Comparison of the predicted air pollutant concentrations with the UK AQS objectives;
- Determination of the likely significant effects of construction works and activities, and consideration of the environmental management controls likely to be employed during the works;

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- Determination of the likely significant effects of the operational phase of the Development on air quality, based on the application of the EPUK/IAQM guidance significance criteria to the modelled results; and

Further information on the assessment of baseline conditions is provided in sections 4 and 6 of Appendix 11.1.

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Construction Phase

Table 11.2 sets out the general principals, along with professional judgement that have been considered to determine the scale of sensitivity that has been applied to receptors identified and considered within the construction phase assessment.

Table 11.2

Scale of receptor sensitivity used in the construction phase assessment

SENSITIVITY	DUST SOILING EFFECTS	HEALTH EFFECTS	ECOLOGICAL EFFECTS
High	Locations where users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Indicative examples include dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms.	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	Locations with an international or national designation and the designated features may be affected by dust soiling; or locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain*. Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	Locations where users would expect* to enjoy a reasonable level of amenity, but would not reasonably expect* to enjoy the same level of amenity as in their home; or the appearance, aesthetics or value of their property could be diminished by soiling; or the people or property wouldn't reasonably be expected* to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Indicative examples include parks and places of work	Locations where the people exposed are workers**, and exposure is over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM10, as protection is covered by Health and Safety at Work legislation.	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition. An indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	Locations where the enjoyment of amenity would not reasonably be expected*; or the property would not reasonably be expected* to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks** and roads.	Locations where human exposure is transient***. Indicative examples include public footpaths, playing fields, parks and shopping streets.	Locations with a local designation where the features may be affected by dust deposition. An indicative example is a local Nature Reserve with dust sensitive features.
<i>Notes</i>	* People's expectations will vary depending on the existing dust deposition in the area, see Section 4.2. ** Car parks can have a range of sensitivities depending on the duration and frequency that people would be expected to park their cars there, and the level of amenity they could reasonably expect whilst doing so. Car parks associated with work place or residential parking might have a high level of sensitivity compared to car parks used less frequently and for shorter durations, such as those associated with shopping. Cases should be examined on their own merits	* This follows Defra guidance as set out in LAQM.TG(09). ** Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected to exposure of PM10. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers. For this reason workers have been included in the medium sensitivity category. *** There are no standards that apply to short-term exposure, e.g. one or two hours, but there is still a risk of health impacts, albeit less certain.	* Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.

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Operational Phase

Table 11.3 sets out the scale of sensitivity that has been applied to receptors identified and considered within the operational phase assessment.

Table 11.3
Scale of receptor sensitivity used in the operational phase assessment

SENSITIVITY	RECEPTOR
Very High	Hospitals, residential care homes
High	Residential, schools
Medium	Offices, shops
Low	Transient locations (footpaths, street, parks)
Negligible	No receptors are considered negligible regarding air quality

Assessment of Magnitude

Construction Phase

The assessment of magnitude of impacts during the construction phase was undertaken using the criteria set out in Table 11.4.

Table 11.4
Criteria for the Potential Dust Emissions Class

TYPE OF EFFECT	MAGNITUDE	INDICATIVE CRITERIA
Demolition	Large	Total Building volume > 50,000m ³ , potentially dusty construction material (e.g. concrete), on site crushing and screening, demolition activities > 20m above ground level.
	Medium	Total Building volume 20,000-50,000m ³ , potentially dusty construction material, demolition activities 10-20m above ground level.
	Small	Total Building volume < 20,000m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities < 10m above ground, demolition during wetter months.
Earthworks	Large	Total site area > 10,000m ² , potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehicles active at any one time, formation of stockpile enclosures > 8m in height, total material moved > 100,000 tonnes.
	Medium	Total site area 2,500m ² - 10,000m ² , moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of stockpile enclosures 4m-8m in height, total material moved 20,000 tonnes – 100,000 tonnes (where known).
	Small	Total site area < 2,500m ² , soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of stockpile enclosures < 4m in height, total material moved < 10,000 tonnes, earthworks during wetter months.
Construction	Large	Total Building volume > 100,000m ³ , piling, on site concrete batching, sand blasting.

TYPE OF EFFECT	MAGNITUDE	INDICATIVE CRITERIA
	Medium	Total building volume 25,000 m ³ - 100,000m ³ , potentially dusty construction material (e.g. concrete), on site concrete batching.
	Small	Total building volume < 25,000m ³ , construction material with low potential for dust release (e.g. metal cladding or timber).
Trackout	Large	> 50 HDV (> 3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay/silt content), unpaved road length > 100m.
	Medium	10-50 HDV (> 3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50-100m (high clay content).
	Small	< 10 HDV (> 3.5t) trips in any one day, surface material low potential for dust release, unpaved road length < 50m.

Operational Phase

The operational phase assessment was undertaken based on the description of development contained in chapter 3 of this volume of the ES.

The assessment of magnitude of impacts during the operational phase is Table 11.5

indicates the scale of impact magnitude that has been used in undertaking the assessment. This is based on EPUK /IAQM guidance. Further detail on the AQAL matrix is contained in Table 9 in Appendix 11.1.

Table 11.5
Scale of magnitude for air quality impacts used in the assessment

MAGNITUDE	% CHANGE IN NO ₂ , PM ₁₀ , OR PM _{2.5} CONCENTRATIONS RELATIVE TO AQAL
Very large	> 10% of AQAL
Large	6-10% of AQAL
Medium	2-5% of AQAL
Small	1% of AQAL
Negligible	< 1% of AQAL

Note: Magnitude would be attributed to the highest percentage change in NO₂, PM₁₀ or PM_{2.5} concentrations

Assessment of Significance

Construction Phase

The assessment of significance for the construction phase is based on the matrix presented in Table 11.6.

Table 11.6
Construction Phase Significance Matrix

	SENSITIVITY OF AREA	DUST EMISSION MAGNITUDE		
		LARGE	MEDIUM	SMALL
Demolition	High	Major	Moderate	Moderate
	Medium	Major	Moderate	Minor
	Low	Moderate	Minor	Negligible
Earthworks	High	Major	Moderate	Minor
	Medium	Moderate	Moderate	Minor
	Low	Minor	Minor	Negligible
Construction	High	Major	Moderate	Minor
	Medium	Moderate	Moderate	Minor
	Low	Minor	Minor	Negligible
Trackout	High	Major	Moderate	Minor
	Medium	Moderate	Minor	Negligible
	Low	Minor	Minor	Negligible

Operational Phase

The assessment of significance within this chapter for the operational phase is based on the matrix presented in Table 11.7.

Table 11.7
Operational Phase Significance Matrix

MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR				
	Very High	High	Medium	Low	Negligible
Very Large	Major	Major	Major	Moderate	Negligible
Large	Major	Major	Moderate	Minor	Negligible
Medium	Major	Moderate	Moderate	Minor	Negligible
Small	Moderate	Minor	Minor	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Relevant Associated Development

No relevant associated development has been assessed within the chapter.

Assumptions/Limitations

For the purposes of the assessment of dust nuisance during demolition and construction works it has been assumed activities would be carried

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out at the boundary of the Development to provide a worst-case assessment.

Currently there is no methodology to assess and determine the impact of a development against the EU Limit Values. Compliance with the EU Limit Values is a UK Government's responsibility given that national measures (such as vehicle scrappage schemes and increased diesel fuel prices) would be required to meet compliance. As such, the effect of the Development has been assessed against the UK AQS objectives rather than the EU Limit values.

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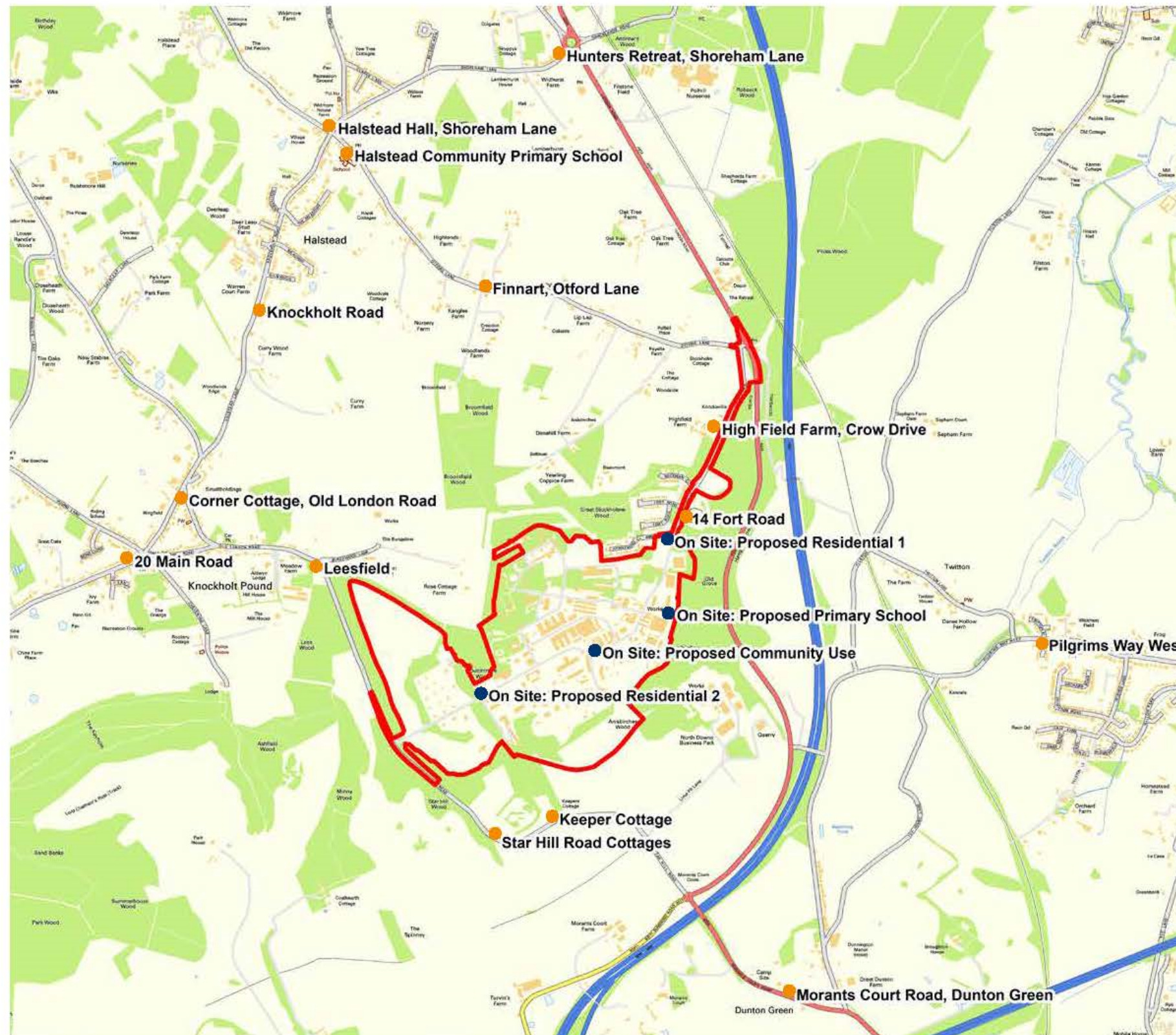
11.3. BASELINE CONDITIONS




Construction Phase

KEY RECEPTORS	RECEPTOR DESCRIPTION	SENSITIVITY	FURTHER INFORMATION
Receptors sensitive to dust soiling	Receptors can be affected by construction activities up to 350m from the Site boundary. There are estimated to be between 10-100 highly sensitive residential receptors within 50m of the Site.	Medium	Section 5, Appendix 11.1
Receptors sensitive to human health	The Defra background PM ₁₀ concentration for the Site was 14.7µg/m ³ and the mean at the Greatness Park Automatic Monitor was 19.0µg/m ³ in 2018.	Low	Section 5, Appendix 11.1
Ecological sensitive receptors	The site does not lie within or adjacent to any sites designated at European, national or local level on the basis of the ecological importance	Low	Section 5, Appendix 11.1

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Figure 11.1 Site Boundary and Sensitive Receptors



-  Site Boundary
-  Existing Receptor Locations
-  Proposed Receptor Locations



Project Details	WIE14806-100: Fort Halstead
Figure Title	Figure 11.1: Site Boundary and Sensitive Receptors
Figure Ref	WIE14806-100_GR_ES_11.1A
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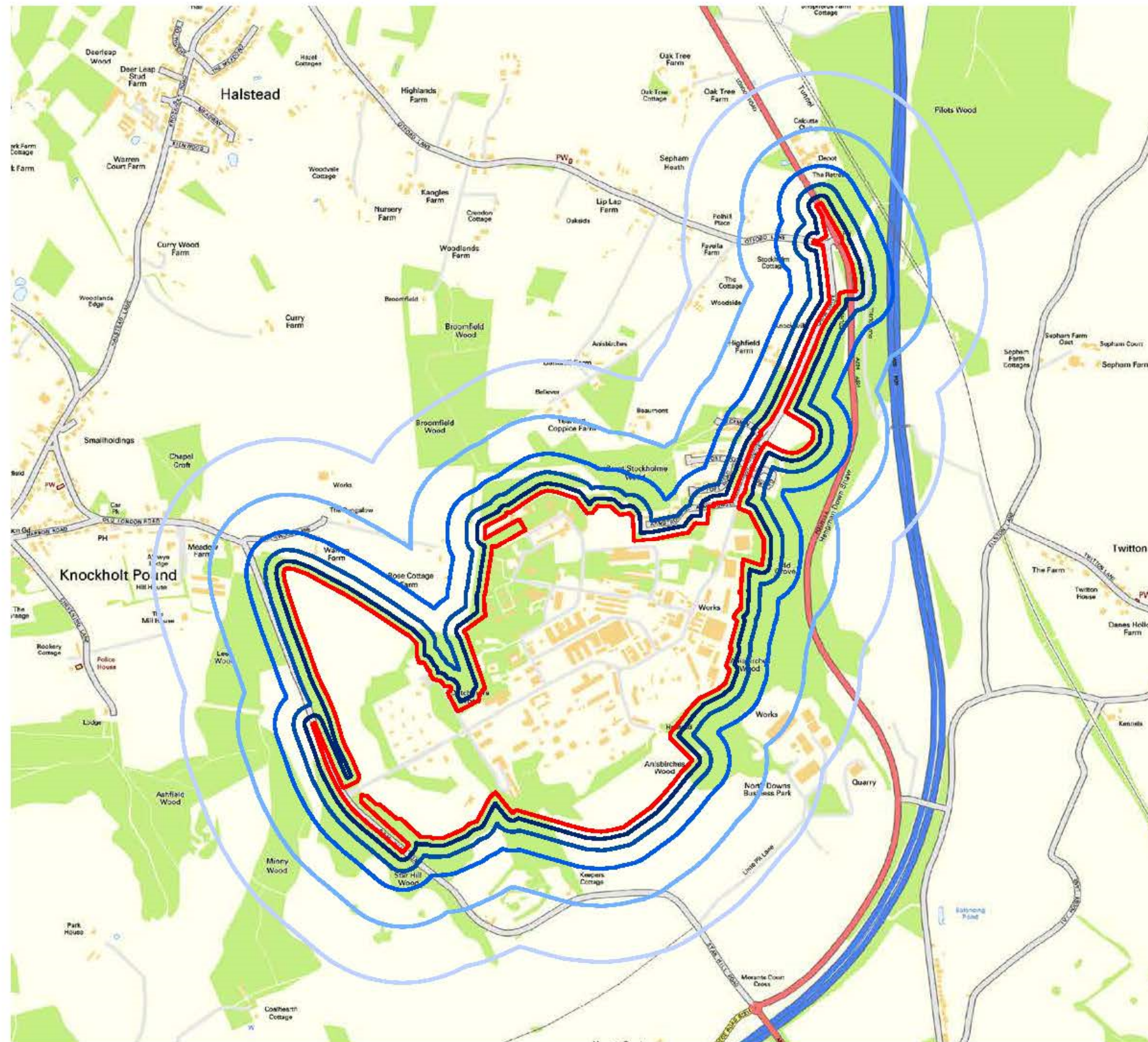
KEY RECEPTORS	RECEPTOR DESCRIPTION	PREDICTED BASELINE (2018)				SENSITIVITY	FURTHER INFORMATION
		NO ₂ ANNUAL MEAN (µG/M ³)	PM ₁₀ ANNUAL MEAN (µG/M ³)	PM ₁₀ - NUMBER OF DAYS > 50µG/M ³	PM _{2.5} ANNUAL MEAN (µG/M ³)		
Keeper Cottage, Star Hill Road	Existing residential property located approximately 0.2km south from the closest Site boundary	16.4	19.4	2	10.3	High	Table 13 and 14, Section 6, Appendix 11.1
Star Hill Road Cottages	Existing residential property located approximately 0.25km south from the closest Site boundary	17.4	19.6	2	9.0	High	Table 13 and 14, Section 6, Appendix 11.1
Leesfield, Knockholt	Existing residential property located approximately 0.1km west from the closest Site boundary	16.4	19.4	2	8.9	High	Table 13 and 14, Section 6, Appendix 11.1
14 Fort Road, Halstead	Existing residential property located adjacent to the closest Site boundary	17.7	19.6	2	9.2	High	Table 13 and 14, Section 6, Appendix 11.1
High Field Farm, Crow Drive, Halstead	Existing residential property located approximately 0.05km south from the closest Site boundary	17.8	19.6	2	9.3	High	Table 13 and 14, Section 6, Appendix 11.1
Corner Cottage, Old London Road, Knockholt	Existing residential property located approximately 0.7km northwest from the closest Site boundary	17.1	19.5	2	9.2	High	Table 13 and 14, Section 6, Appendix 11.1
20 Main Road, Knockholt	Existing residential property located approximately 0.8km northwest from the closest Site boundary	15.8	19.3	2	9.0	High	Table 13 and 14, Section 6, Appendix 11.1
Knockholt Road, Halstead	Existing residential property located approximately 1.1km northwest from the closest Site boundary	15.0	19.2	2	8.9	High	Table 13 and 14, Section 6, Appendix 11.1
Halstead Community Primary School	Existing school located approximately 1.6km north from the closest Site boundary	15.0	19.2	2	10.3	High	Table 13 and 14, Section 6, Appendix 11.1
Halstead Hall, Shoreham Lane, Halstead	Existing residential property located approximately 1.7km north from the closest Site boundary	15.4	19.2	2	9.0	High	Table 13 and 14, Section 6, Appendix 11.1
Hunters Retreat, Shoreham Lane	Existing residential property located approximately 1.2km north from the closest Site boundary	17.4	19.5	2	8.9	High	Table 13 and 14, Section 6, Appendix 11.1
Finnart, Otford Lane, Halstead	Existing residential property located approximately 0.9km north from the closest Site boundary	15.2	19.2	2	9.2	High	Table 13 and 14, Section 6, Appendix 11.1
Morants Court Road, Dunton Green	Existing residential property located approximately 1.1km southeast from the closest Site boundary	21.6	20.1	3	9.3	High	Table 13 and 14, Section 6, Appendix 11.1
Pilgrims Way West	Existing residential property located approximately 1.3km east from the closest Site boundary	19.8	19.9	3	9.2	High	Table 13 and 14, Section 6, Appendix 11.1
On Site: Proposed Residential 1	Future residential property located within the Site boundary		n/a as not present in baseline			High	Table 13 and 14, Section 6, Appendix 11.1
On Site: Proposed Community Use	Future community use located within the Site boundary		n/a as not present in baseline			High	Table 13 and 14, Section 6, Appendix 11.1
On Site: Proposed Residential 2	Future residential property located within the Site boundary		n/a as not present in baseline			High	Table 13 and 14, Section 6, Appendix 11.1
On Site: Proposed Primary School	Future Primary School located within the Site boundary		n/a as not present in baseline			High	Table 13 and 14, Section 6, Appendix 11.1







11.4. POTENTIAL SIGNIFICANT IMPACTS

PHASE	DESCRIPTION	ADVERSE/BENEFICIAL
Construction	The potential impacts of construction traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} at existing and proposed sensitive receptors	Adverse
Construction	The potential impacts of nuisance dust generated by construction activities at existing and proposed sensitive receptors	Adverse
Operation	The potential impacts of traffic generated by the proposed development once operational on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} at existing and proposed sensitive receptors.	Adverse

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Figure 11.2 Construction Phase Assessment Bands



-  Site Boundary
-  20m from Site Boundary
-  50m from Site Boundary
-  100m from Site Boundary
-  200m from Site Boundary
-  350m from Site Boundary



Project Details	WIE14806-100: Fort Halstead
Figure Title	Figure 2: Construction Phase Assessment Bands
Figure Ref	WIE14806-100_GR_AQ_2A
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11.5. DESIGN INTERVENTIONS

DESIGN INTERVENTION	DESCRIPTION	REASON FOR INTERVENTION	FURTHER INFORMATION
No design interventions specific to air quality were required or implemented.	-	-	-

11.6. ASSESSMENT PRE-MITIGATION (INCLUDING DESIGN INTERVENTION)

Construction Phase

PHASE	RECEPTOR(S) AFFECTED	IMPACT	MAGNITUDE PRE-MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION PROPOSED?	FURTHER INFORMATION
Construction	All receptors within 350m of the Site boundary	Demolition The total building volume to be demolished is estimated to exceed 50,000m ³ and occur less than 10m above ground. The magnitude of the impact has been based on the criteria in the IAQM guidance.	Large	Major Adverse	Yes	Section 3 Appendix 11.1
Construction	All receptors within 350m of the Site boundary	Earthworks The area of the Site is 74.49 hectares (744,900m ²). The magnitude of the impact has been based on the criteria in the IAQM guidance.	Large	Moderate Adverse	Yes	Section 3 Appendix 11.1
Construction	All receptors within 350m of the Site boundary	Construction The total volume of buildings to be constructed would exceed 100,000m ³ . The magnitude of the impact has been based on the criteria in the IAQM guidance.	Large	Moderate Adverse	Yes	Section 3 Appendix 11.1
Construction	All receptors within 350m of the Site boundary	Trackout PBA (Transport Consultants) have estimated that the number of outward HDV movements would be 42 per day (Monday to Saturday). The magnitude of the impact has been based on the criteria in the IAQM guidance.	Medium	Minor Adverse	Yes	Section 3 Appendix 11.1
Construction	All receptors within 350m of the Site boundary	The number of HDV construction vehicles entering and egressing Site is predicted to be 42 (two-way) on the busiest days. The change in pollutant concentrations would be less than 1% change relative to AQAL.	Negligible	Negligible	No	Section 3 Appendix 11.1
Construction	All receptors within 350m of the Site boundary	Based on professional judgement, emissions from plant operating on the Site would be very small in comparison to the emissions from traffic movements on the roads adjacent to the Site	Negligible	Negligible	No	Section 3 Appendix 11.1

Operational Phase

PHASE	RECEPTOR(S) AFFECTED	IMPACT	MAGNITUDE PRE-MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION PROPOSED?	FURTHER INFORMATION
Operation	Keeper Cottage, Star Hill Road	Increase of 0.75% (0.3µg/m ³) in the NO ₂ Concentration . The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0.25% (0.1µg/m ³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0%(0.1µg/m ³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	Star Hill Road Cottages	Increase of 1.5% (0.6µg/m ³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0.75% (0.3µg/m ³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.1µg/m ³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	Leesfield, Knockholt	Increase of 1% (0.4µg/m ³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0.5% (0.2µg/m ³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.1µg/m ³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	14 Fort Road, Halstead	Increase of 0.75% (0.3µg/m ³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0.5% (0.2µg/m ³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.1µg/m ³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	High Field Farm, Crow Drive, Halstead	Increase of 0.25% (0.1µg/m ³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m ³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.1µg/m ³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1

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PHASE	RECEPTOR(S) AFFECTED	IMPACT	MAGNITUDE PRE-MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION PROPOSED?	FURTHER INFORMATION
Operation	Corner Cottage, Old London Road, Knockholt	Increase of 0.75% (0.3µg/m³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0.5% (0.2µg/m³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.1µg/m³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	20 Main Road, Knockholt	Increase of 0% (0.0µg/m³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	Knockholt Road, Halstead	Increase of 0% (0.0µg/m³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	Halstead Community Primary School	Increase of 0.25% (0.1µg/m³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	Halstead Hall, Shoreham Lane, Halstead	Increase of 0% (0.0µg/m³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	Hunters Retreat, Shoreham Lane	Increase of 0.25% (0.1µg/m³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	Finnart, Otford Lane, Halstead	Increase of 0.25% (0.1µg/m³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	Morants Court Road, Dunton Green	Increase of 0.5% (0.2µg/m³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	Pilgrims Way West	Increase of 0.25% (0.1µg/m³) in the NO ₂ Concentration. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0.25% (0.1µg/m³) in the PM ₁₀ Concentration relative to AQAL. The Development would result in a Negligible magnitude as per Table 11.5 Increase of 0% (0.0µg/m³) in the PM _{2.5} Concentration. The Development would result in a Negligible magnitude as per Table 11.5	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	On Site: Proposed Residential 1	The predicted NO ₂ concentration assuming no reduction in background concentrations from 2018 would be 18.6µg/m³. The NO ₂ , PM ₁₀ (19.0µg/m³) and PM _{2.5} (9.1µg/m³) concentrations would all meet the AQS objectives. Exposure to future users of the Development would be negligible.	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	On Site: Proposed Community Use	The predicted NO ₂ concentration assuming no reduction in background concentrations from 2018 would be 21.2µg/m³. The NO ₂ , PM ₁₀ (19.4µg/m³) and PM _{2.5} (9.3µg/m³) concentrations would all meet the AQS objectives. Exposure to future users of the Development would be negligible.	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	On Site: Proposed Residential 2	The predicted NO ₂ concentration assuming no reduction in background concentrations from 2018 would be 20.4µg/m³. The NO ₂ , PM ₁₀ (19.3µg/m³) and PM _{2.5} (10.3µg/m³) concentrations would all meet the AQS objectives. Exposure to future users of the Development would be negligible.	Negligible	Negligible	No	Section 4 Appendix 11.1
Operation	On Site: Proposed Primary School	The predicted NO ₂ concentration assuming no reduction in background concentrations from 2018 would be 17.1µg/m³. The NO ₂ , PM ₁₀ (18.8µg/m³) and PM _{2.5} (10.0µg/m³) concentrations would all meet the AQS objectives. Exposure to future users of the Development would be negligible.	Negligible	Negligible	No	Section 4 Appendix 11.1

11.7. MITIGATION & ENHANCEMENT MEASURES

PHASE	POSSIBLE EFFECT BEING MITIGATED	MITIGATION MEASURE	HOW SECURED / TRIGGER	MAGNITUDE POST-MITIGATION	ADVERSE/BENEFICIAL	FURTHER INFORMATION
Construction	Potential damage to health at all existing sensitive receptors	The environmental management controls, with reference to the IAQM guidance relating to high risk sites. All relevant management control measures are set out below:	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1

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PHASE	POSSIBLE EFFECT BEING MITIGATED	MITIGATION MEASURE	HOW SECURED / TRIGGER	MAGNITUDE POST-MITIGATION	ADVERSE/BENEFICIAL	FURTHER INFORMATION
Construction	Potential damage to health at all existing sensitive receptors	<p>Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.</p> <p>Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.</p> <p>Display the head or regional office contact information.</p>	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1
Construction	Potential damage to health at all existing sensitive receptors	<p>Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.</p> <p>Make the complaints log available to the local authority when asked.</p> <p>Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book</p>	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1
Construction	Potential damage to health at all existing sensitive receptors	<p>Carry out regular site inspections to monitor compliance with the Dust Management Plan, record inspection results, and make the inspection log available to the local authority when asked</p> <p>Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions</p>	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1
Construction	Potential damage to health at all existing sensitive receptors	<p>Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible</p> <p>Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site</p> <p>Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period</p> <p>Avoid sit runoff of water and mud</p> <p>Keep site fencing, barriers and scaffolding clean using wet methods.</p> <p>Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover</p> <p>Cover, seed or fence stockpiles to prevent wind whipping</p>	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1
Construction	Potential damage to health at all existing sensitive receptors	<p>Ensure all vehicles switch off engines when stationary – no idling vehicles</p> <p>Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable</p>	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1
Construction	Potential damage to health at all existing sensitive receptors	<p>Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems</p> <p>Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate</p> <p>Use enclosed chutes and conveyors and covered skips</p> <p>Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate</p> <p>Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.</p>	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1
Construction	Potential damage to health at all existing sensitive receptors	Avoid bonfires and burning of waste materials	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1
Construction	Potential damage to health at all existing sensitive receptors	<p>Ensure effective water suppression is used during demolition operations</p> <p>Avoid explosive blasting, use appropriate manual or mechanical alternatives</p> <p>Bag and remove any biological debris or damp down such material before demolition</p>	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1
Construction	Potential damage to health at all existing sensitive receptors	<p>Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.</p> <p>Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable</p>	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1

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PHASE	POSSIBLE EFFECT BEING MITIGATED	MITIGATION MEASURE	HOW SECURED / TRIGGER	MAGNITUDE POST-MITIGATION	ADVERSE/BENEFICIAL	FURTHER INFORMATION
		Only remove the cover in small areas during work and not all at once				
Construction	Potential damage to health at all existing sensitive receptors	Avoid scabbling (roughening of concrete surfaces) if possible Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a process, in which case ensure that appropriate additional control measures are in place	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1
Construction	Potential damage to health at all existing sensitive receptors	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary. Avoid dry sweeping of large areas. Ensure vehicles entering and leaving sites are covered to prevent escape of materials Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. Record all inspections of haul routes and any subsequent action in a site log book. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable) Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. Access gates to be located at least 10m from receptors where possible.	Planning condition - CEMP	Negligible	Adverse	Section 7 Appendix 11.1

11.8. ASSESSMENT POST-MITIGATION

Construction Phase

PHASE	RECEPTOR	RESIDUAL IMPACT	RESIDUAL EFFECT						
			SIGNIFICANCE	ADV/BEN	ST/MT/LT	D/IND	P/T	R/IRR	
Construction	All receptors within 350m of the Site boundary	Demolition The implementation of mitigation measures are routinely and successfully applied to major construction projects throughout the UK and are proven to reduce significantly the potential for adverse nuisance dust effects associated with the demolition stage of construction work.	Negligible	Adverse	Short-term	Direct	Temporary	Reversible	
Construction	All receptors within 350m of the Site boundary	Earthworks The implementation of mitigation measures are routinely and successfully applied to major construction projects throughout the UK and are proven to reduce significantly the potential for adverse nuisance dust effects associated with the earthworks of construction work.	Negligible	Adverse	Short-term	Direct	Temporary	Reversible	
Construction	All receptors within 350m of the Site boundary	Construction The implementation of mitigation measures are routinely and successfully applied to major construction projects throughout the UK and are proven to reduce significantly the potential for adverse nuisance dust effects associated with the construction stage of construction work.	Negligible	Adverse	Short-term	Direct	Temporary	Reversible	
Construction	All receptors within 350m of the Site boundary	Trackout The implementation of mitigation measures are routinely and successfully applied to major construction projects throughout the UK and are proven to reduce significantly the potential for adverse nuisance dust effects associated with the trackout of construction work.	Negligible	Adverse	Short-term	Direct	Temporary	Reversible	
Construction	All receptors within 350m of the Site boundary	The residual impact of construction traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} would remain as per the assessment pre-mitigation	Negligible	Adverse	Short-term	Direct	Temporary	Reversible	
Construction	All receptors within 350m of the Site boundary	Emissions from Plant on Site would remain as per the assessment pre-mitigation.	Negligible	Adverse	Short-term	Direct	Temporary	Reversible	

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Operational Phase

PHASE	RECEPTOR	RESIDUAL IMPACT	RESIDUAL EFFECT						
			SIGNIFICANCE	ADV/BEN	ST/MT/LT	D/IND	P/T	R/IRR	
Operation	Keeper Cottage, Star Hill Road	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	Star Hill Road Cottages	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	Leesfield, Knockholt	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	14 Fort Road, Halstead	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	High Field Farm, Crow Drive, Halstead	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	Corner Cottage, Old London Road, Knockholt	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	20 Main Road, Knockholt	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	Knockholt Road, Halstead	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	Halstead Community Primary School	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	Halstead Hall, Shoreham Lane, Halstead	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	Hunters Retreat, Shoreham Lane	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	Finnart, Otford Lane, Halstead	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	Morants Court Road, Dunton Green	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	Pilgrims Way West	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	On Site: Proposed Residential 1	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	On Site: Proposed Community Use	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	On Site: Proposed Residential 2	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	
Operation	On Site: Proposed Primary School	The residual impact of operational traffic and plant on concentrations of NO ₂ , PM ₁₀ and PM _{2.5} is negligible	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible	

11.9. AIR QUALITY: INTER-CUMULATIVE SCHEME IMPACTS

CUMULATIVE SCHEME	SCHEME DESCRIPTION	POTENTIAL FOR CUMULATIVE IMPACTS?	CONSIDERED WITHIN ASSESSMENT?
Former West Kent Cold Store	Redevelopment of site so as to accommodate a mixed-use development comprising 500 one, two, three, four and five bedroom residential units; 2,300sqm of commercial floor space (use class B1) and 460sqm medical facility together with associated access roads, car parking, landscaping and open space	The former west Kent cold store scheme would have the potential to produce increased traffic flows to the surrounding road network	Yes

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Consideration of Cumulative Effects

PHASE	RECEPTOR	RESIDUAL IMPACT	ADDITIONAL MITIGATION (IF REQUIRED)	RESIDUAL EFFECT SIGNIFICANCE	ADV/BEN	ST/MT/LT	D/IND	P/T	R/IRR
Construction	All Receptors including proposed residential and primary school	Nuisance Dust It is expected that Construction Environmental Management Plans would be developed for the other cumulative scheme with measures agreed to ensure dust suppression during construction activities.	None Required	Negligible	Adverse	Short-term	Direct	Temporary	Irreversible
Construction	All Receptors including proposed residential and primary school	Construction Vehicle Emissions Exhaust emissions from the combined construction traffic of the Development and the cumulative scheme could give rise to cumulative residual effects on local air quality. This would depend upon the extent to which the implementation of the proposed Development and the cumulative scheme overlap.	Vehicle routing to be agreed with Sevenoaks District Council	Minor	Adverse	Short-term	Direct	Temporary	Irreversible
Construction	All Receptors including proposed residential and primary school	Construction Plant Emissions It was considered that even in a combined situation with construction plant being used simultaneously at the Site and for the cumulative scheme, the emissions would not be significant in the context of the existing adjacent road traffic and exhaust emissions.	None Required	Negligible	Adverse	Short-term	Direct	Temporary	Irreversible
Operation	All Receptors including proposed residential and primary school	The relevant cumulative schemes would increase traffic flows on the surrounding road networks which would lead to an increase in NO ₂ , PM ₁₀ and PM _{2.5} concentrations at the sensitive receptor locations. However, the traffic data used within the air quality assessment for the future year of 2030 includes traffic related to other relevant cumulative schemes in the surrounding area. The Cumulative effects would remain as per the assessment of the Development.	None Required	Negligible	Adverse	Long-term	Direct	Permanent	Irreversible

Key: ADV/BEN = Adverse/Beneficial; ST/MT/LT = Short-term/Medium-term/Long-term; D/IND = Direct/Indirect; P/T = Permanent/Temporary; R/IRR = Reversible/Irreversible

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