CLEVE HILL SOLAR PARK

ENVIRONMENTAL STATEMENT

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CHAPTER 16 - AIR QUALITY

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16 AIR QUALITY

16.1 Introduction

1. This chapter of the ES evaluates the effects of the Development as described in Chapter 5: Development Description upon local air quality. The assessment considers potential emissions of fugitive dust during construction and decommissioning activities and the effects of vehicle exhaust emissions associated with the construction and decommissioning phases of the Development.

2. The scope and extent of the assessment, as set out in section 2.2.2.2 of Chapter 2: Environmental Impact Assessment has been determined by a combination of professional judgement and the EIA Scoping Opinion issued by The Planning Inspectorate.

3. This chapter has utilised data relating to vehicle movements in the construction phase of the Development, and therefore should be referenced with Chapter 14: Access and Traffic.

4. This chapter is supported by the following figure, provided in Volume 2 (DCO Document Reference 6.2.16):

    - Figure 16.1, which illustrates the air quality study areas and receptors.

16.1.1 Development Parameters Assessed

5. The Development is described in Chapter 5: Development Description. In summary, it includes the transportation and installation of photovoltaic (PV) modules, energy storage modules and accompanying electric cables, transformers, string inverters and associated access, environmental and construction works.

6. The Rochdale Envelope parameters for the Development have been considered with respect to the potential effects considered in this Chapter, and worst-case values/scenarios for this are captured by the candidate design, as set out in Chapter 5: Development Description. This chapter reports the assessment of effects associated with the candidate design, therefore. Traffic generation predictions have been made on the same basis as set out in Chapter 14, Access and Traffic, of this ES. Notably, the more northerly of the two roads from Seasalter Road to the electrical compound has been assessed, and a battery pack design has been assumed, both of which are the worst case of the scenarios included in the Rochdale Envelope with respect to traffic and comprise the candidate design.

16.2 Assessment Methodology

16.2.1 Consultation and Scope of Assessment

7. In response to section 4.13 of the Cleve Hill Solar Park Scoping Opinion (Ref EN010085), the Planning Inspectorate deemed it necessary to assess the effects of both the increased traffic movements and fugitive dust emissions associated with the construction and decommissioning phases of the Development on local air quality.

8. This chapter sets out:

    - The relevant legislative and policy requirements for, and guidance on, air quality assessment;
    - The methods employed in the assessment;
    - Baseline air quality conditions;
    - Assessment of effects;
    - Mitigation measures; and

- Cumulative effects assessment and the statement of significance.

9. The likelihood of the operational phase having an effect on air quality is very low, and as such the assessment of air quality effects arising from the operational phase of the Development has been scoped out.

16.2.2 Section 42 Consultation

10. In May 2018 a Preliminary Environmental Information Report (PEIR) was compiled for consultation as part of the Applicant's duties under Section 42 of the Planning Act 2008. All responses to this were reviewed by the authors with respect to comments made in relation to the assessment of air quality effects. Following this there were no changes required to the assessment undertaken for the PEIR; the only change to the assessment has been an update of the DMRB screening assessment in light of updated traffic volumes. Specific responses to these comments are provided in the Consultation Report submitted along with the DCO application.

16.2.3 Legislative Context

11. The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017[1] establish in broad terms what is to be considered when determining the effects of development proposals on air quality.

12. The following legislation, guidance and information sources have been considered in carrying out this assessment.

16.2.3.1 EU Directives and UK Legislation

13. European Union legislation forms the basis for UK air quality policy. Directive 96/62/EC and the first three daughter objectives were combined to form the European Union Directive 2008/50/EC (European Parliament, 2008) on Ambient Air Quality and Cleaner Air for Europe, which came into force June 2008 UK Air Quality Strategy.

14. The 1995 Environment Act requires the preparation of a National Air Quality Strategy, which sets air quality standards and objectives for specified pollutants. The Act also outlines measures to be taken by local planning authorities in relation to meeting these standards and objectives, which is set out in the Local Air Quality Management (LAQM) system.

15. The first UK Air Quality Strategy, (Department of Environment 1997), brought together European Union Legislation, technical and policy developments and the latest information on health effects of air pollution. The strategy was revised and reissued as the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Department of the Environment, Transport and the Regions 2000). This was subsequently amended in 2003 (DETR) and in July 2007 (Defra).

16.2.3.2 Local Air Quality Management (LAQM)

16. The current air quality standards and objectives for the study species are presented in Table 16.1. Pollutant standards relate to health-based ambient pollutant concentrations in air, whereas pollutant objectives incorporate target dates and in some cases margin of tolerance.

17. Where an air quality objective is unlikely to be met by the relevant deadline, local planning authorities must designate those locations as Air Quality Management Areas (AQMAs) and take action to work towards meeting the objectives. Following the designation of an AQMA, local planning authorities are required to develop an Air Quality Action Plan (AQAP) to work towards meeting the objectives and to improve air

[1] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available online. http://www.legislation.gov.uk/uksi/2017/572/contents/made Accessed 17/05/2018

quality locally. New developments must factor into their impact assessments the current status of any AQMA and how the development would interact with it. A number of AQMAs have been declared within the Swale Borough Council area. The nearest is the Ospringe Street AQMA[2], located approximately 3.3 km from the Development site.

18. Possible exceedances of air quality objectives are usually assessed in relation to those locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective. These objective figures are utilised in the assessment of new projects as part of the assessment of potential traffic and access effects on air quality.

Table 16.1 Air Quality Objectives for the purpose of LAQM in England[3]

Pollutant	**Air Quality Objective**	
	Concentration	**Measured as:**
Nitrogen dioxide (NO_2)	200 µg.m^{-3}	1-hour mean not to be exceeded more than 18 times per year
	40 µg.m^{-3}	Annual mean
Particulate Matter (PM_{10})	50 µg.m^{-3}	24-hour mean not to be exceeded more than seven times per year
	40 µg.m^{-3}	Annual mean

16.2.3.3 National Policy Statement EN-1

19. National Policy Statement (NPS) for Energy, EN-1[4], states that infrastructure development can have adverse effects on air quality (paragraph 5.2.1). The construction, operation and decommissioning phases can involve emissions to air which could lead to adverse impacts on health, on protected species and habitats, or on the wider countryside.

20. NPS EN-1 goes on to say (at paragraphs 5.2.6 and 5.2.7) that "*where the project is likely to have adverse effects on air quality the applicant should undertake an assessment of the impacts of the proposed project as part of the Environmental Statement. The ES should describe:*

- *Any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project;*
- *Existing air quality levels and the relative change in air quality from existing levels."*

21. The Infrastructure Planning Commission (now the Secretary of State) should generally give air quality considerations substantial weight where a project would lead to a deterioration in air quality in an area, or leads to a new area where air quality breaches any national air quality limits.

22. The requirements of NPS EN-1 have been met by the assessment reported in this Chapter.

16.2.3.4 National Planning Policy Framework (NPPF)

23. On a national level, air quality can be a material consideration in planning decisions.

[2] Ospringe AQMA [online] https://uk-air.defra.gov.uk/aqma/details?aqma_ref=687 [Accessed 14 May 2018]
[3] Defra (2017). Air Quality Objectives Update. [online] Defra UK Air. Available at: https://uk-air.defra.gov.uk/assets/documents/National_air_quality_objectives.pdf [Accessed 25 Jan. 2018].
[4] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf

24. The National Planning Policy Framework (NPPF) (2018)[5] sets out national planning policy for England; designed to make the planning system less complex, to protect the environment and promote sustainable development. The NPPF states at paragraph 170 that planning policies and decisions should contribute to and enhance the natural and local environment by *"preventing new and existing development from contributing to, or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability".*

25. The NPPF states that the effects of pollution on health and the sensitivity of the area and the development should be taken into account.

26. Paragraph 181 of the NPPF states *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts on air quality from individual sites in local areas... Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan".*

27. The NPPF is supported by Planning Practice Guidance (PPG), which includes guiding principles on how planning can take account of the impacts of new development on air quality. This is detailed below under the Air Quality Guidance section.

16.2.3.5 Kent and Medway Air Quality Planning Guidance

28. In 2015, following an extensive review of the partnership guidance published in 2011, the Kent and Medway Air Quality Partnership introduced new air quality planning guidance[6] in response to changes in national planning policy.

29. The Kent and Medway Air Quality Planning Guidance introduces a method for assessing the air quality impacts of a development including the quantification of impacts, calculation of damage and the identification of mitigation measures to be implemented to negate the impact of development on air quality. The guidance provides advice on dealing with cumulative impacts, all in order to provide clarity and consistency of the process for developers, the local planning authority (LPA) and local communities.

30. In the summary section of the guidance[7], the following is stated:

> *"This document has been developed to improve air quality across Kent and Medway and encourage emissions reductions to improve the environment and health of the population. In addition it aims to provide consistency as far as is practicable across the Kent and Medway area in the approach to air quality in the planning regime. In producing this document the Council also aims to provide developers with clear information as to what it will require and consistency in how it will approach planning applications in terms of air quality, which should help to speed up the planning process."*

16.2.4 Guidance

31. The Government's online Planning Practice Guidance (PPG)[8] states that air quality concerns are more likely to arise where development is proposed within an area of

[5] Ministry of Housing, Communities and Local Government (2018). National Planning Policy Framework. [online] Gov.uk. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2 [Accessed 15 Oct. 2018].
[6] KentAir (2015). Air Quality Planning Guidance. [online] Kent and Medway Air Quality Partnership. Available at: http://kentair.org.uk/documents/k&maqp_air_quality_planning_guidance_mitigation_option_a.pdf [Accessed 25 Jan. 2018].
[7] KentAir (2015). Air Quality Planning Guidance. [online] Kent and Medway Air Quality Partnership. Available at: http://kentair.org.uk/documents/k&maqp_air_quality_planning_guidance_mitigation_option_a.pdf [Accessed 25 Jan. 2018].

existing poor air quality, or where it would adversely impact upon the implementation of air quality strategies and/or action plans.

32. Under the Air Quality section, paragraph 005 of the PPG states that *"Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife)".*

33. Paragraph 007 of the PPG sets out the information that may be required in an air quality assessment, making clear that *"Assessments should be proportionate to the nature and scale of development proposed and the level of concern about air quality".*

34. Paragraph 008 provides guidance on mitigating air quality impacts, stating *"Mitigation options where necessary, will depend on the proposed development and should be proportionate to the likely impact".*

35. When deciding whether air quality is relevant to a planning application, consideration should be given to whether the development would lead to:

- Significant effects on traffic, such as volume, congestion, vehicle speed or composition;
- The introduction of new point sources of air pollution, such as furnaces, centralised boilers and Combined Heat and Power (CHP) plant; and
- Exposing occupants on any new developments to existing sources of air pollutants and areas with poor air quality.

36. This assessment has been undertaken with reference to a number of guidance manuals that offer technical advice and best practice measures on the assessment of air quality issues for the use of air quality professionals. The guidance has been produced by relevant technical experts and professional bodies that specialise in air quality assessment. A list of the guidance and information sources utilised in the assessment is provided in Table 16.2.

Table 16.2 Key information sources

Data source	Reference
Kent Air	Kent and Medway Air Quality Partnership: Air Quality Planning Guidance (2015)[9]
Department for Environment Food and Rural Affairs (Defra)	Defra (2016) Local Air Quality Management Technical Guidance TG(16)
Defra's Local Air Quality Management (LAQM) Support Portal	LAQM 1 x 1 km grid background pollutant maps[10]
Environmental Protection UK (EPUK)/ Institute of Air Quality Management (IAQM)	EPUK/IAQM (2017) Development Control: Planning for Air Quality (v1.1)[11]

[8] DCLG (2014), 'Planning Practice Guidance: Air Quality (ID 32)' Last Updated 6/3/2014. Available online: http://planningguidance.communities.gov.uk/blog/guidance/air-quality/ Accessed 15 Oct. 2018
[9] Kentair.org.uk. (2015). Kent & Medway Air Quality Partnership. [online] Available at: http://kentair.org.uk/documents/K&MAQP_Air_Quality_Planning_Guidance_Mitigation_Option_A.pdf [Accessed 6 Mar. 2018].
[10] Defra (2016). Local Air Quality Management Policy Guidance. [online] Defra.gov.uk. Available at: https://laqm.defra.gov.uk/assets/laqmpolicyguidance2016.pdf [Accessed 6 Mar. 2018].
[11] IAQM and EPUK (2017). Land-Use Planning & Development Control: Planning For Air Quality. [online] Iaqm.co.uk. Available at: http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf [Accessed 6 Mar. 2018].

Data source	Reference
Institute of Air Quality Management (IAQM)	IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction[12].
	IAQM (2012b) Dust and Air Emissions Mitigation Measures

16.2.5 Study Areas

37. In relation to construction and decommissioning phase dust emissions, and in accordance with the Institute of Air Quality Management Technical Guidance (IAQM, 2012a)[13] and the DMRB (Highway Agency, 2016), the Construction Dust Study Area extends to:

- Within 350 metres (m) of the Development site; and
- Within 100 m of the route(s) used by vehicles on the public highway, up to 500 m from the site entrance(s).

38. Technical guidance reports a distance of up to 100 m as a threshold within which ecological receptors may be affected by dust raising activities (IAQM, 2012a).

39. In relation to construction and decommissioning phase traffic emissions, in accordance with guidance detailed in DMRB (Highway Agency, 2016), the Construction Traffic Study Area extends to within 200 m of the road network utilised by vehicles to the junction with the A299.

40. These distances take into account the exponential decline in airborne dust particles and the rate of deposition with distance from the source; they are regarded as conservative (IAQM, 2012a).

41. The location and extent of the study areas are shown on Figure 16.1.

42. Note that the study areas are based on the above buffer distances from areas with proposed activity with the potential to create dust, which comprises a sub-set of the whole Development site. Within the areas with proposed construction activity, much of the area will be used for solar panel installation. This involves driving metal poles into the ground, and then attaching to them a support framework and panels. This process does not create appreciable dust, and has less potential to create dust than the baseline farming activities. The study areas for construction dust are buffered around the access track, spine road and substation compound and its bund. Areas outside this are considered to have lesser potential to create dust than in the baseline scenario. This is also the case in the decommissioning phase.

16.2.6 Approach to Assessment

43. The assessment comprised a desktop study with both qualitative and quantitative elements, based on professional judgement and relevant guidance as outlined herein.

44. The 2015 Kent and Medway Air Quality Planning Guidance was reviewed in order to establish the existing conditions at, and in proximity to, the Development. Existing baseline air quality conditions within the Study Area were assessed using UK pollutant maps available from the Defra LAQM support portal and air quality monitoring data published in KentAir's most recent LAQM reports.

[12] IAQM (2014). Guidance on the Assessment of dust from demolition and construction. [online] Iaqm.co.uk. Available at: http://iaqm.co.uk/wp-content/uploads/guidance/iaqm_guidance_report_draft1.4.pdf [Accessed 6 Mar. 2018].
[13] IAQM (2012). Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites. [online] Iaqm.co.uk. Available at: http://www.iaqm.co.uk/wp-content/uploads/guidance/monitoring_construction_sites_2012.pdf [Accessed 8 Mar. 2018].

45. The assessment concludes with a review to determine if the anticipated effects are significant in terms of the EIA Regulations.

16.2.7 Construction Phase Dust Emissions Assessment Methodology

46. In 2014, the IAQM published a guidance document 'Guidance on the Assessment of Dust from Demolition and Construction'[14], this guidance has been used to undertake the assessment of dust emissions. Descriptors for magnitude and significance used for the assessment of air quality in the assessment of construction phase dust emissions are taken from the IAQM guidance and detailed within this section.

47. The term 'effects' is utilised within the guidance as it refers to the consequence of changes in airborne concentrations and/or dust deposition for a receptor. The guidance refers to impacts as the change in concentrations irrespective of whether there are effects on receptors. This terminology is used within this assessment.

48. Activities on construction sites are divided into four activities for assessing dust creating potential:

- Demolition;
- Track-out;
- Earthworks (*e.g.*, soil stripping, excavation); and
- Construction (activities associated with new structures).

49. No demolition of existing structures is proposed and therefore this activity is scoped out of the assessment.

50. Track-out is identified as 'the transport of dust and dirt from a construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network' (IAQM, 2014). Significant particulate track-out may occur up to 500 m from large sites, 200 m from medium sites and 50 m from small sites. There are two potential route options under consideration as detailed in Chapter 5: Development Description, both of which comprise a bound surface between Seasalter Road and the substation compound, a distance of at least 1 km. As there are no public roads within 500 m of the point where the surface would become unbound, i.e., west of the substation compound, track-out effects do not require assessment. This is a change since the PEIR, in that the access roads have since been designed to be metalled, reducing the potential for track-out effects. Notwithstanding this, measures to minimise dust creation and movement are set out in Technical Appendix A5.4, Outline Construction Environmental Management Plan, section 4.4.

51. The dust risk assessment assesses the following three impact risks:

- The risk of dust impact to human and property receptors;
- The risk of dust impact to ecological receptors; and
- The risk of dust impact to human health.

52. This is comprised of a qualitative method using a set of matrices and is repeated for each of the three activities involved (Earthworks and Construction).

53. The assessment methodology follows a stepped approach:

- Step 1: Screen the need for detailed assessment;
- Step 2: Assess the risk of dust effects arising;
- Step 3: Identify the need for site specific mitigation; and
- Step 4: Define effects and their significance.

[14] IAQM (2014). Guidance on the assessment of dust from demolition and construction. [online] Iaqm.co.uk. Available at: http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf [Accessed 1 Feb. 2018].

54. Step 1 is to screen where there are sensitive receptors within the Study Area as defined by IAQM (2014). This step was undertaken using Ordnance Survey Address Layer Data 2 in GIS which identifies properties within the Study Area.

55. Step 2 is to assess the risk of dust effects on these sensitive receptors and assign a risk category to the Development site. The risk category is determined by a number of factors:

- The scale and nature of the works, which determines the risk of dust arising (the dust emission magnitude as shown in Table 16.3); and
- The proximity of sensitive receptors to these potential risks.

56. The sensitivity of the area to human health impacts is assessed based on the background PM_{10} concentration at the Development site, the number of receptors and their sensitivity and the distance of these receptors from the source. This is presented in Table 16.3.

Table 16.3 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			< 20	< 50	< 100	< 200	< 350
High	**> 32 µg/m³ (>18 µg/m³ in Scotland)**	**> 100**	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28 - 32 µg/m³ (14-16 µg/m³ in Scotland	**> 100**	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 – 28 µg/m³ (14 – 16 µg/m³ in Scotland)	**> 100**	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	< 24 µg/m³ (< 14 µg/m³ in Scotland)	**> 100**	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 -10	Low	Low	Low	Low	Low
Medium	**> 32 µg/m³ (>18 µg/m³ in Scotland)**	**>10**	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32 µg/m3 (14-16 µg/m3 in Scotland	**>10**	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 – 28 µg/m3 (14 – 16 µg/m3 in Scotland	**>10**	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	< 24 µg/m3 (< 14 µg/m3 in Scotland)	**>10**	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Low	**-**	**≥1**	Low	Low	Low	Low	Low

57. The classification of dust emission magnitude is determined based on the area size and dust raising potential of the earthworks and construction activities, resulting in either a ***small***, ***medium*** or ***large*** magnitude (Table 16.4).

Table 16.4 Determination of dust emission magnitude[15]

Activity	Criteria used to determine dust emission class		
	Large	**Medium**	**Small**
Earthworks	Total site area >10,000 m^2. Potentially dusty soil type. >10 heavy earth moving vehicles active at any one time. Formation of bunds >4 m – 8 m in height. Total material moved >100,000 tonnes	Total site area 2,500 – 10,000 m^2, moderately dusty soil type (e.g., silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m – 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes.	Total site area <2,500 m^2. Soil type - large grain size (*e.g.*, sand). <5 heavy earth moving vehicles at any time of day. Surface material - with low potential for dust release. Surface material with low potential for dust release. Unpaved road length <50 m.
Construction	Total building volume >100,000 m^3. On site concrete batching. Dusty construction material. Sandblasting.	Total building volume 25,000 – 100,000 m^3. Potentially dusty construction material (e.g., concrete). On site concrete batching	Total building volume <25,000m^3. Construction material with low potential for dust release (e.g., metal cladding or timber)

58. The people and property sensitivity of the area to dust soiling (Table 16.5) is determined from the combination of the individual receptor sensitivity (based on the number of properties) with the distance from the source activity resulting in a **low**, **medium** or **high** sensitivity to dust soiling.

Table 16.5 Determination of the sensitivity of the area to dust soiling effects on people and property [16]

Receptor Sensitivity	Number of receptors	Distance from the Source (m)			
		<20	**<50**	**<100**	**<350**
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

59. The sensitivity of the area to dust soiling effects on ecological receptors (Table 16.6) is determined from the combination of the individual receptor sensitivity (based on ecological designation) with its distance from the source activity.

Table 16.6 Determination of the sensitivity of the area to ecological impacts [17]

Receptor Sensitivity	Distance from the source (m)	
	<20	**<50**
High	High	Medium
Medium	Medium	Medium
Low	Low	Low

60. The area sensitivities are used in combination with the dust emission magnitude of each of the source activities to produce the risk of dust impact (Table 16.7). The risk of

[15] IAQM (2014). Guidance on the assessment of dust from demolition and construction. [online] Iaqm.co.uk. Available at: http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf [Accessed 31 Jan. 2018].
[16] IAQM (2014). Guidance on the assessment of dust from demolition and construction. [online] Iaqm.co.uk. Available at: http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf [Accessed 31 Jan. 2018].
[17] IAQM (2014). Guidance on the assessment of dust from demolition and construction. [online] Iaqm.co.uk. Available at: http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf [Accessed 31 Jan. 2018].

dust impact is assessed separately for each part of the development for both human and property receptors and ecological receptors.

Table 16.7 Risk of Dust Impact

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

61. Step 3 provides appropriate and proportionate site-specific mitigation measures. For those cases where the risk is assigned as negligible, no mitigation measures are required. Note, adherence to any legislative and regulatory construction site control measures falls outside mitigation and would still be required.

62. Step 4 concludes whether the Development will have significant effects (defined as significant or not significant) once the risk of dust impact has been determined and mitigation measures have been applied to each of the three on-site activities. Negligible and low risk translate to an effect that is not significant and a risk defined as medium or high will translate to a significant effect.

16.2.8 Construction Phase Traffic Emissions Assessment Methodology

63. The potential impact of exhaust emissions from construction vehicles on local air quality has been assessed using the Highways Agency's DMRB (version 1.03c). This is a screening tool that allows for the prediction of air pollutant concentrations at specified distances from road sources, accounting for the background pollutant concentrations (obtained from Defra's LAQM support portal for the respective year of assessment).

64. The DMRB methodology requires data relating to vehicle speeds, the distance between the receptor and the roads carrying the traffic, and the proportion of HGVs. In this way, predicted changes in air quality resulting from the development were established and pollutant concentrations compared to the Air Quality Strategy objectives.

65. The DMRB methodology states that there is unlikely to be any significant effect on air quality due to changes in road traffic flows at properties beyond 200 m from any roads. Traffic flow data, comprising 24-hour AADT flows and traffic composition, including percentage HGVs was collated by Curtins, the EIA traffic consultant and principal author of Chapter 14, Access and Traffic, of this ES.

66. Construction traffic emissions are assessed in terms of the potential changes in the ambient levels of NO_2 and PM_{10} that a construction project may bring about. The traffic data used in the air quality assessment is detailed in Chapter 14: Access and Traffic. Should the traffic numbers associated with the Development change by the time the ES is produced, then an updated assessment of effects would be undertaken in the ES.

67. The significance of any changes in pollutant concentrations in relation to construction traffic emissions are considered in the context of the National Air Quality Objectives detailed in the Government's Air Quality Strategy and the Environmental Protection UK (EPUK) and IAQM guidance document 'Land-Use Planning & Development Control: Planning for Air Quality 2017'[18].

68. Table 16.8 provides a matrix for assigning a magnitude of change for increases or decreases in the annual mean values of NO_2 and PM_{10} from negligible to substantial as

[18] IAQM (2017). Land-Use Planning & Development Control: Planning for Air Quality. [online] Available at: IAQM (2014). Guidance on the assessment of dust from demolition and construction. [online] Iaqm.co.uk. Available at: http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf [Accessed 1 Feb. 2018]. [Accessed 1 Feb. 2018].

published in the IAQM guidance (2017)[19]. The Air Quality Assessment Level (AQAL) can be an Air Quality Objective (AQO), EU limit or target value or the Environmental Agency Environmental Assessment level (EAL). The *"% change in concentration relative to the AQAL"* represents the concentration contributed by the development as a percentage of the total AQAL value. This is combined with the *"Long term average concentration at the receptor in an assessment year"* (annual mean concentration), which is categorised into percentage ranges of the amount it is above or below the AQAL. These parameters are combined to measure the degree of potential harm on a scale from negligible to substantial based on if the total concentration(s) of the pollutant(s) exceed the AQAL.

Table 16.8 Air quality impact descriptors for changes to annual mean of NO_2 and PM_{10}

Long term average Concentration at receptor in assessment year	**% Change in Concentration relative to Air Quality Assessment level (AQAL)**			
	≤1	**2-5**	**6-10**	**≥10**
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76%-94% of AQAL	Negligible	Slight	Moderate	Moderate
95%-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

69. In accordance with IAQM and EPUK guidance, the above framework for describing impacts has been used as a starting point to make a judgement on significance of effect in EIA terms, but the extent of impact (both geographic coverage and numbers of receptors affected) and other factors will also be considered. Professional judgement has been used to consider the significance of effects, having regard to the influence and validity of assumptions adopted when undertaking the prediction of impacts.

16.2.9 Non-Road Mobile Machinery

70. The effects of emissions from non-road mobile machinery (NRMM) are dependent upon a variety of factors including operational on-times, loading, ground and meteorological conditions, and are difficult to quantify accurately. Except in the electrical compound, the use of NRMM will be on any given area of the site for a short period of time, before moving on. Associated effects on receptors will therefore be very short-lived, much shorter than the whole construction phase. As a result, emissions from NRMM were considered qualitatively within the context of existing air quality conditions and the temporary nature of the construction activities of the Development.

16.3 Baseline Air Quality

71. This section summarises the background air quality within the study area. Data for the current year (2018) and the anticipated year of construction for assessment purposes (2022) are presented. Construction is programmed to commence in spring 2021 and last for 24 months. The only year fully within the construction period is anticipated to be 2022, and hence this year was selected for assessment purposes.

[19] IAQM (2017). Land-Use Planning & Development Control: Planning for Air Quality. [online] Available at: IAQM (2014). Guidance on the assessment of dust from demolition and construction. [online] Iaqm.co.uk. Available at: http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf [Accessed 1 Feb. 2018]. [Accessed 1 Feb. 2018].

72. Baseline air quality is the air quality in the absence of the Development. This is comprised of background pollutant concentrations, which are the concentrations generally present in the wider area, and contributions from baseline traffic levels.

16.3.1 Local Air Quality Management Review

73. Following a review of air quality, the Kent and Medway air quality monitoring network (an air quality monitoring group that represents and is funded by the district and borough councils within Kent) has identified a number of AQMAs within the Swale Borough Council Area. None of the AQMAs are located within the Study Area; the nearest is Ospringe Street AQMA located approximately 3.2 km from the Development site. The effect on AQMAs has therefore been scoped out of the assessment.

16.3.2 Local Air Quality Monitoring

74. The Kent and Medway air quality monitoring network undertakes automatic monitoring of pollutants at the following four monitoring stations:

- Newington;
- St Pauls Street, Sittingbourne;
- Canterbury Road, Sittingbourne; and
- Ospringe Street near Faversham.

75. The closest automatic monitoring station is located on Ospringe Street, Faversham (at grid reference: 600367, 160869) approximately 3.2 km southwest of the Development site.

76. The Kent and Medway air quality network undertakes NO_2 diffusion tube monitoring with the closest diffusion tube "SW27" located approximately 3.2 km southwest of the Development site on Ospringe Street.

77. Traffic volumes would be higher and vehicle speeds would be expected to be lower at the Ospringe Street monitoring locations resulting in higher concentrations of NO_2 compared to those of the Development site and nearby receptors. Therefore, concentrations at the diffusion tube and automatic monitoring station locations are not representative of the ambient air quality conditions in the vicinity of the Development site and have therefore not been included in this assessment.

16.3.3 Background Air Quality Concentrations

78. Baseline annual mean concentrations of NO_2 and PM_{10} were obtained from the Defra LAQM portal pollutant maps (see Table 16.2) for the 1 km x 1 km grid squares encompassing the Development site.

79. Table 16.9 depicts the annual mean concentrations found within the Development site during the 2018 baseline year and for the assessed year of construction, 2022.

Table 16.9 Background pollutant concentrations for 2018, 2022, for all grid-squares covering the Study Area

Grid Square	Current Background 2018 (µg/m^3)		Future Background – Year of Construction 2022 (µg-m3)	
	NO_2	PM_{10}	NO_2	PM_{10}
601500, 164500	8.1	12.5	7.2	12.2
601500, 163500	8.6	13.2	7.3	13.0
602500, 163500	8.3	13.3	7.3	13.0

Grid Square	Current Background 2018 (µg/m^3)		Future Background – Year of Construction 2022 (µg-m3)	
602500, 164500	7.9	12.9	7.0	12.6
603500, 162500	8.3	13.4	7.3	13.1
603500, 163500	8.1	13.1	7.1	13.4
603500, 164500	7.8	13.2	6.9	12.8
604500, 160500	**11.7**	**15.4**	**9.8**	**15.1**
604500, 161500	8.9	14.6	7.7	14.3
604500, 162500	8.1	13.8	7.1	13.5
604500, 163500	7.8	14.0	6.8	13.7
604500, 164500	7.6	14.2	6.7	13.9
604500, 162500	8.1	13.8	7.1	13.5
605500, 161500	10.5	14.2	9.0	13.9
605500, 162500	8.3	13.5	7.2	13.2
605500, 163500	7.7	13.3	6.8	13.0
605500, 164500	7.5	13.1	6.6	12.8

Note: Bold values are the highest across all locations. This location is adjacent to the A299, in the vicinity of the M2.

80. For the purposes of the assessment the background concentrations at the modelled locations closest to each of the receptors have been used.

81. All background concentrations are predicted to be substantially below the respective annual mean air quality objectives in 2018 and 2022. The baseline air quality information and data contained within Table 16.9 indicates that current and future background air quality conditions are well within the prescribed objective limits within the Study Area.

16.3.4 Identification of Receptors

16.3.4.1 Construction Dust Assessment

82. Receptors sensitive to dust emissions in the Construction Dust Study Area were identified (Step 1).

Residential Receptors

83. Approximately 28 receptors were identified within 350 m of potentially dust-creating activities (as per the distances set out in Table 16.5), all of which are residential properties. These receptors are shown on Figure 16.1.

Ecological Receptors

84. There are two sites of ecological interest with statutory designations that are at least partially within the Study Area.

85. The Swale Site of Special Scientific Interest (SSSI)/ Ramsar site/ Special Protection Area (SPA) are overlapping designations which border the Development site and are partially within the Study Area. The Swale SSSI/ Ramsar/ SPA includes the largest remaining areas of freshwater grazing marsh in Kent and is representative of the estuarine habitats found on the north Kent coast. The area has been designated for the following reasons:

- The number of internationally important wintering and passage wildfowl and waders;
- The species richness in invertebrate populations with over 350 species of invertebrate having been recorded;
- The species richness in vegetation and plant life including saltmarsh-grasses and calcareous flora; and
- The habitats provided by the Swale SSSI which support a wide range of animals.

86. South Bank of the Swale Local Nature Reserve LNR/SSSI, which is partially within the Study Area and borders the Development site to the northeast.

87. The 2014 IAQM guidance on the assessment of dust from demolition and construction[20] requires ecological receptors to be considered if they contain habitats that could be sensitive to dust.

88. The ecological designations within the Study Area at most risk of impact from dust arising from the Development, and which have been included as assessed ecological receptors within the assessment, are:

- The Swale SSSI;
- The Swale Ramsar; and
- The South Bank of the Swale LNR/SSSI.

89. These designations border the Development site and have been designated due to the rare plant and invertebrate species that reside within their boundaries. Dust can have harmful effects on both plants and invertebrates through physical and chemical effects impacting vital biological processes.

90. The Swale SPA has been designated due to its diversity of bird species. The designation consists principally of thick mudflat habitats and it is highly unlikely that the birds will be impacted by the addition dust from the Development, therefore the Swale SPA has been scoped out of the assessment.

Summary

91. As sensitive receptors are located within the Construction Dust Study Area it is necessary to proceed to Step 2 of the assessment and assess the risk of dust arising on these receptors.

16.3.4.2 Construction Traffic

Human Receptors

92. A total of 73 sensitive receptors (principally residential properties) were identified within the Study Area for construction traffic effects. Of these, five were selected as being representative of those receptors that would be potentially subject to worst case air quality effects arising from the Development, as presented in Table 16.10 and illustrated on Figure 16.1 as "DMRB Receptors". These receptors were chosen based on their proximity to the assessed road network, representing locations at which emissions

[20] IAQM (2014). Guidance on the assessment of dust from demolition and destruction. [online] Iaqm.co.uk. Available at: http://iaqm.co.uk/wp-content/uploads/guidance/iaqm_guidance_report_draft1.4.pdf [Accessed 30 Jan. 2018].

from construction traffic were predicted to have the greatest effect on air quality, above the baseline.

93. The DMRB screening assessment requires the annual average speed for each road link assessed, as the speed affects the pollutant emission rate for each vehicle type. All annual speeds were based on the national speed limits imposed on each road link respectively. Table 16.11 represents the AADT data utilised within the baseline scenario assessment.

Table 16.10 Human receptors assessed using the DMRB screening assessment

Receptor	National Grid References		Distance from Seasalter Road (m) (L1)	Distance from Head Hill Road (m) (L2)	Distance from Sandbanks Lane (m) (L3)	Assessed road link (s)*
	Easting	Northing				
Existing Residential Receptor (DMRB R1)	605464	163197	2	-	-	1
All Saints Church Graveney (DMRB R2)	605277	162681	4.57	-	-	1
Graveney Primary School (DMRB R3)	605100	162243	3.79	39.8	28.6	1, 2, 3
Existing Residential Receptor (DMRB R4)	605048	162025	12.2	-	-	1
Existing Residential Receptor (DMRB R5)	605052	162182	2.82	-	3.30	1, 3

Table 16.11 Baseline AADT traffic data used within the DMRB screening assessment

Road Link		Total daily AADT traffic flows				Speed (kph)
		2018 Baseline	% HGV	2022 Baseline	% HGV	
L1	Seasalter Road	1,625	4	1,711	4	53.8
L2	Head Hill Road	2,833	7	2,983	7	53.8
L3	Sandbanks Lane	397	8	418	8	61.6

94. Speed data is the 85%ile from traffic surveys undertaken for the Development in 2017, as an average of the two carriageways.

95. Background traffic flows for the A299 were collected from the Department for Transport website[21] for 2016. These were adjusted using a traffic growth factor of 1.0823[22] for 2022 which gave an AADT of 50,296. The Development would make a negligible contribution, less than 0.42%, to this existing flow and so the link and the residential receptor located at the junction between the A299 and Whitstable Road were not included in the assessment.

[21] https://www.dft.gov.uk/traffic-counts/cp.php?la=Kent#26888 [Accessed 16 May 2018]
[22] Growth factor from Automated Traffic Growth Calculator available online: https://laqm.defra.gov.uk/.../RTF-Automated-Traffic-Growth-Calculator-v3-1.xls. Accessed 17/05/2018.

Ecological Receptors

96. The only ecological receptor identified within the Construction Traffic Assessment Study Area is The Swale Special Protection Area (SPA), Ramsar and Site of Special Scientific Interest (SSSI), which is located on the east side of Seasalter Road, near to the entrance to the Development, and the west side of Seasalter Road and north side of the site access road. This receptor, located at coordinates 605692, 163539, is identified as DMRB-R6 on Figure 16.1 and has been modelled with the traffic from L1 (Seasalter Lane) at a distance of 2 m from the centre of the carriageway.

16.3.5 Baseline Sources of Pollution

97. Baseline road traffic is considered in the DMRB assessment of road traffic effects, as set out in Table 16.11.

98. The only other specific source of potential pollution in the baseline scenario, with the potential to affect the receptors considered in this chapter, is dust from soil disturbance created during farming activities on the site. Ploughing, *etc.*, the land during dry, windy conditions can create airborne dust with potential to affect off-site receptors. This is relevant, because the "with Development" scenario includes the dust creation potential of the installation of solar panels (driving poles into the ground), and the cessation of soil-disturbing farming activities. The dust-creating potential of farming activities is, in all areas where panels are proposed, greater than the dust-creating potential of installing solar panels, and hence the solar panel areas have not been used in the definition of construction dust study areas in section 16.2.5.

16.3.6 Baseline Air Quality

99. The baseline air quality has been modelled using the DMRB screening assessment, for each of the 6 receptors, in 2018 (current baseline) and 2022 (future baseline, without the Development). The modelling was based on the traffic data provided in Table 16.11. The results are presented in Table 16.12.

Table 16.12 Baseline Air Quality at Receptor Locations

Receptor	Road link assessed	Annual Mean NO_2 ($\mu g/m^3$)	Annual Mean PM_{10} ($\mu g/m^3$)	Annual Mean NO_2 ($\mu g/m^3$)	Annual Mean PM_{10} ($\mu g/m^3$)
		2018	**2018**	**2022**	**2022**
DMRB-R1	1	8.26	13.41	7.37	13.11
DMRB-R2	1	8.86	13.61	7.77	13.31
DMRB-R3	1,2,3	**9.33**	**13.71**	**8.24**	**13.42**
DMRB-R4	1	8.79	13.59	7.69	13.30
DMRB-R5	1, 3	9.01	13.64	7.92	13.34
DMRB-R6	1	8.36	13.42	7.37	13.11

Note: Bold values are the highest

16.4 Assessment of Effects

16.4.1 Construction Phase Dust Assessment

100. Earthwork activities such as excavation, haulage of materials around the site on stone roads, tipping and stockpiling, site levelling and clearing, bund formation and landscaping are potential sources of dust emission if not properly controlled. These activities are proposed along the spine road and the electrical compound (with bund). Other areas of the site will not have dust-creation potential, as set out in sections 16.3.4 and 16.3.5, above. The potential effect on sensitive receptors will vary

depending on where within the Development site the dust-raising activity takes place, the nature of the activity and controls and meteorological dispersion conditions.

101. The potential for sensitive receptors to be affected by on-site construction activities depends on construction method(s), materials and the duration of the construction works.

16.4.1.1 Receptor Sensitivity

102. There are no residential property receptors, which are high sensitivity to dust, within 100 m of construction and earthworks activities, and five within 350 m. These properties are Graveney Hill Farm, Crown Cottages and Cleve Farm.

103. The sensitivity of the area to human health impacts is **low** due to the fact that there are less than 10 human receptors within 350 m of the earthworks and construction activities and the low ambient PM_{10} concentrations of the study area, according to Table 16.3.

104. The sensitivity of the area to dust soiling effects on people and property receptors is **low** due to the fact there are five high sensitivity human and property receptors within 350 m of the earthworks and construction activities, in accordance with Table 16.5.

105. The Swale SPA, Ramsar and SSSI ecological designations are located on the east side of Seasalter Road at the entrance to the Development, and also on the west side of the site including Faversham Creek. They are wetland habitats, principally, with grassland fringes, and support important bird populations. They are also very large areas, and the part within close proximity to dust-creating activities from the Development is extremely small (much less than 1% of the total area). As a result, these receptors are considered to have low sensitivity to dust effects in general. The spine road, the construction of which is potentially dust-creating, extends to the west side of the site, to within 20 m of a small section of these designations, which is identified, using Table 16.6, to have **low** sensitivity.

16.4.1.2 Magnitude and Significance

Earthworks

106. The dust emission class for earthwork activities has been determined with reference to Table 16.4 and professional judgement. The area of site works (the spine road, cable routing and the electrical compound) will be more than 10,000 m^2, and the nature of the works, involving rock deposition and earthworks, is considered to be potentially dusty. The dust emission magnitude is therefore considered to be **large**, in accordance with Table 16.4**.**

107. During earthworks activities, before mitigation, the risk to human health, dust soiling to human and property receptors and ecological receptors is assessed, in accordance with Table 16.7, as being **low.**

Construction

108. For a site of this size there is relatively little dust creating construction work on-site, it being restricted to the electrical compound, transformers and solar PV module installation. The within-site electrical cables will run in trenches between the transformers and the substation, and lead to earthworks effects only. The transformers are prefabricated and delivered to site so require minimal construction works. The batteries are delivered in the same units in which they are installed, and so involve minimal construction. On-site concrete batching is proposed within the electrical compound area. The total construction area for these purposes including the control building and concrete batching facility, has a volume less than 25,000 m^3 and the dust emission magnitude is therefore classed as **small**, according to Table 16.4.

109. During construction activities, before mitigation, the risk to human health and of dust soiling to human and property receptors and ecological receptors is considered to be **negligible**, in accordance with Table 16.7.

16.4.1.3 Summary

110. Table 16.13 summarises the potential overall significance in terms of construction dust without any mitigation measures applied.

111. Construction dust emissions may have an effect on the short term PM_{10} objective in close proximity of dust raising activities. However, existing baseline PM_{10} concentrations are well below the annual mean PM_{10} objective, which is unlikely to be exceeded during the temporary construction period.

Table 16.13 Summary of the Impacts of Construction Dust

Source	Risk of Development giving rise to dust effects	Risk of Development giving rise to dust soiling	
	Human Health Impacts	Ecological Receptors	Human and Property Receptors
Earthworks	Low Risk	Low Risk	Low Risk
Construction	Negligible Risk	Negligible Risk	Negligible Risk

16.4.2 Decommissioning Phase Dust Assessment

112. Any predicted dust effects arising from decommissioning will be similar in nature and no greater than those predicted for the construction phase, as outlined above, which have been found to be not significant for both human and ecological receptors.

16.4.3 Construction Phase Vehicle Emissions

113. Emissions of nitrogen dioxide (NO_2) and airborne particulate matter (PM_{10}) are strongly related to vehicle speeds, with highest vehicle emission rates occurring at very slow speeds and lowest emission rates occurring in free flowing traffic. HGVs associated with site construction works will change the traffic volume and composition on haul roads, potentially resulting in reduced speeds and hence increased NO_2 and PM_{10} emissions along the route.

114. The assessment considers the section of the road network most likely to experience the highest increase in traffic volume as a consequence of construction traffic.

115. The construction traffic data, presented in Table 16.14, has been based on traffic utilising the local road network within the vicinity of the Development. Further detail is provided in Chapter 14: Access and Traffic. The principal local roads proposed for construction traffic use are Head Hill Road and Seasalter Road.

Table 16.14 Construction AADT traffic data used within the DMRB screening assessment

Road link(s) utilised		Total daily AADT traffic flows				% increase in traffic flow
		2022 Without Development	% HGV	2022 With Development	% HGV	
1	Seasalter Road	1,711	4%	1,933	7%	13.0%
2	Head Hill Road	2,983	7%	3,205	8%	7.4%
3	Sandbanks Lane	418	8%	418	8%	0%

116. Table 16.14 shows there is no increase in traffic from the Development on Sandbanks Lane as this is not used by construction vehicles. There is a minimum increase of 7.4% on Head Hill Road and a maximum increase in traffic of 13% on Seasalter Road during the construction phase.

117. The results of the DMRB construction assessment are presented in Table 16.15 and are provided as 'without the Development' and 'with Development' traffic scenarios.

Table 16.15 DMRB screening assessment results

Receptor	Road link assessed	2022 Annual Mean NO_2 (µg/m³)			2022 Annual Mean PM_{10} (µg/m³)		
		Without Development	With Development	Effect (µg/m³)	Without Development	With Development	Effect (µg/m³)
1	1	7.37	7.54	0.17	13.11	13.14	0.03
2	1	7.77	7.94	0.17	13.31	13.34	0.03
3	1,2,3	8.24	8.45	0.21	13.42	13.45	0.03
4	1	7.69	7.84	0.15	13.30	13.32	0.03
5	1, 3	7.92	8.08	0.16	13.34	13.37	0.03
6	1	7.37	7.54	0.17	13.11	13.14	0.03

118. As shown in Table 16.15, there are not predicted to be any exceedances of the annual mean NO_2 and PM_{10} air quality objectives at any identified receptor. The additional construction traffic generated by the Development is predicted to lead to a maximum addition of 0.21 µg/m³ to the annual mean NO_2 concentration for Receptor 3 (Graveney Primary School). This equates to a 'negligible' magnitude of change with reference to Table 16.8. It is also predicted that the increase in construction traffic will have an 'imperceptible' magnitude of change, in terms of annual mean PM_{10} concentrations at the same receptor.

119. The changes in pollutant concentration of NO_2 and PM_{10} have been compared to the relevant significance criteria. The results from the DMRB screening assessment indicate that construction traffic emissions from the Development would have a negligible and **not significant** effect with respect to local air quality impacts.

120. Effects at receptors elsewhere on the construction vehicle route to site, not explicitly modelled, will receive similar or lower effects than those assessed above.

121. In the 2022 "with development scenarios", at the worst case receptor (No. 3), concentrations of the two pollutants are predicted to be approximately 21% and 34% of the respective annual mean objectives, the large majority of which is the background concentrations.

16.4.3.1 Non Road Mobile Machinery (NRMM)

122. Engine exhaust emissions from off-road vehicles known as NRMM have the potential to affect local air quality. The main pollutants of concern from these emissions are those relating to fuel combustion such as NO_2, PM_{10}, carbon monoxide (CO), and sulphur dioxide (SO_2). As set out in section 16.3.6, the baseline air quality is typical of rural areas, and is well below the Air Quality Objectives.

123. Air quality in close proximity to the Study Area is likely to be affected by emissions from NRMM operating during construction of the Development. However, the effect will be local and short term, lasting for the duration of activities within that locality, and only when plant and machinery are being operated. The nearest residential properties to areas where substantial NRMM will be used over a period of time of a few weeks or more are Crown Cottages, which are c. 200 m from the electrical compound. At this distance, in a rural area with low levels of baseline pollution, effects from NRMM are expected to be negligible, based on professional judgement, but as a worst-case have been assessed as slight, in the absence of mitigation. Emissions from NRMM used during construction are predicted to have a slight adverse and **not significant** effect on local air quality impacts in terms of NO_2, PM_{10}, CO and SO_2.

16.4.4 Decommissioning Phase Vehicle Emissions

124. Any predicted vehicle emission effects arising from decommissioning will be similar in nature and no greater than those predicted for the construction phase, as outlined above, which have been found to be not significant for both human and ecological receptors.

16.4.5 Mitigation

16.4.5.1 Construction and Decommissioning Dust

125. Step three of the dust assessment process identifies appropriate site-specific mitigation. These measures are related to whether the site is a low, medium or high risk site. The mitigation measures outlined below are applicable to construction and decommissioning of all elements of the Development.

126. Additional guidance has been provided by the IAQM in relation to dust and air mitigation measures. As some elements and activities of the Development have been assessed as high risk it is recommended that the good practice measures outlined in the IAQM guidance and Greater London Authority's (GLA) guidance on the *control of dust and emissions from construction and demolition* (2006) are followed.

127. An Outline Construction Environmental Management Plan (Outline CEMP) (provided in Technical Appendix A5.4) has been produced to prevent or minimise the release of dust entering the atmosphere and/or being deposited on nearby receptors. Particular attention will be paid to operations which must unavoidably take place close to the site boundary.

128. A number of best practice mitigation measures could be employed to minimise dust emissions during construction and decommissioning. Measures such as, but not limited to, the following will be considered for the final construction environmental management plan (CEMP), and are included in the Outline CEMP which will provide the framework for this:

- Excavation and earthworks areas will be stripped as required in order to minimise exposed areas;
- During excavation works, drop heights from buckets will be minimised to control the fall of materials reducing dust escape;
- Completed earthworks and other exposed areas will be covered with topsoil and re-vegetated as soon as it is practical in order to stabilise surfaces.
- During stockpiling of loose materials, stockpiles shall exist for the shortest possible time;
- Material stockpiles will be low mounds without steep sides or sharp changes in shape;
- Material stockpiles will be located away from the site boundary, sensitive receptors, watercourses and surface drains;
- Material stockpiles will be sited to account for the predominant wind direction and the location of sensitive receptors;
- Water bowsers will be available on site and utilised for dust suppression during roadworks/ vehicle movements when and where required;
- Daily visual inspections will be undertaken to assess need for use of water bowsers, with increased frequency when activities with high potential to generate dust are carried out during prolonged dry or windy conditions;
- Shielding of dust-generating activities;
- Use of enclosed chutes, conveyors and covered skips;
- Covering vehicles carrying dry spoil and other wastes to prevent escape of materials;

- Provision of wheel washing and wet suppression during loading of wagons/vehicles; and
- Daily visual inspections will be undertaken to assess the condition of the junction of the site track with Seasalter Road and its approaches.

129. The Outline CEMP and Technical Appendix A5.5: Outline Decommissioning and Restoration Plan (DRP) accompany Chapter 5: Development Description and set out measures included in the Development design during construction and decommissioning phases to address dust generation.

130. Such measures are routinely and successfully applied to construction projects throughout the UK. They are capable of significantly reducing the potential for adverse nuisance dust effects associated with the various stages of construction work.

131. Effective implementation of the Outline CEMP and incorporation of mitigation measures for Non Road Mobile Machinery (as below) would contribute to reducing the impact of dust emissions arising from earthworks and construction on sensitive receptors.

132. Table 16.16 provides an overall summary of the potential impacts with mitigation measures in place, in relation to construction dust for each element of the Development as discussed above.

Table 16.16 Summary of Residual Significance (Post Mitigation)

Source	**Risk of Development giving rise to dust effects**	**Risk of Development giving rise to dust soiling**	
	Human Health Impacts	**Ecological Receptors**	**Human and Property Receptors**
Earthworks	Negligible Risk	Negligible Risk	Negligible Risk
Construction	Negligible Risk	Negligible Risk	Negligible Risk

16.4.5.2 Road Traffic Emissions

Given the negligible predicted air quality effects arising from construction and decommissioning phase traffic emissions, no mitigation is proposed or considered necessary.

16.4.5.3 Non Road Mobile Machinery (NRMM)

133. Recommended mitigation measures in relation to NRMM are detailed below:

- All NRMM should use fuel equivalent to ultra-low sulphur diesel (fuel meeting the specification within EN590:2004);
- All NRMM should comply with either the current or previous EU Directive Staged Emission Standards (97/68/EC, 2002/88/EC, 2004/26/EC). As new emission standards are introduced the acceptable standards will be updated to the most current standard;
- All NRMM should be fitted with Diesel Particulate Filters conforming to defined and demonstrated filtration efficiency (load/duty cycle permitting).
- The on-going conformity of plant retrofitted with Diesel Particulate Filters, to a defined performance standard, should be ensured through a programme of on-site checks;
- Implementation of energy conservation measures including instructions to throttle down or switch off idle construction equipment; switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded; and ensure equipment is properly maintained to ensure efficient energy consumption; and
- NRMM and plant should be well maintained. If any emissions of dark smoke occur then the relevant machinery will stop immediately and any problem rectified.

134. Implementation of the measures recommended for the mitigation of impacts from NRMM, will reduce the effect on air quality at sensitive receptors to negligible and not significant.

16.5 Cumulative Assessment

135. Consideration has been given to the list of cumulative developments detailed in Chapter 2: Environmental Impact Assessment. Given the negligible air quality residual effects caused by the Development, and the nature of, and intervening distances to, the cumulative developments, there is not considered to be potential for cumulative air quality effects to arise and so no detailed assessment of cumulative effects has been undertaken.

16.6 Statement of Significance

136. This assessment has found that, following mitigation, construction and decommissioning phase dust emissions are predicted to lead to negligible and not significant effects on sensitive human and ecological receptors.

137. Vehicle emissions from construction and decommissioning traffic will not result in any exceedances of the air quality objectives for NO_2 and PM_{10} at any assessed receptors in either the 'with Development' or 'without Development' scenarios. Modelled concentrations of the with Development scenario predict only small changes in NO_2 and PM_{10} concentrations, which are well below the respective air quality objectives at the end of construction in 2022. The predicted effects are negligible for NO_2 and imperceptible for PM_{10}, and not significant.

138. Emissions from NRMM to be utilised during construction and decommissioning are predicted to have, at worst, a slight adverse and not significant effect on air quality. However, successful implementation of robust management and control measures will reduce the local air quality effect associated with NRMM to negligible and not significant.