

West Burton Solar Project

Environmental Statement Chapter 17: Air Quality

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Issue Sheet

**Report Prepared for: West Burton Solar Project Ltd.
DCO Submission**

Environmental Statement Chapter 17: Air Quality

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17 Air Quality

17.1 Introduction

17.1.1 This chapter of the ES evaluates the effects of the Scheme, as described in Chapter 4 Scheme Description [EN010132/APP/WB6.2.4], on air quality at nearby sensitive receptors during construction, operation and decommissioning phases. The aim of this preliminary assessment is to predict the levels of air quality pollutants and assess them to determine whether there are any likely significant effects, taking account of relevant policy, guidelines and best practice.

17.1.2 This Chapter is supported with the following Appendices:

- **Appendix 17.1** West Burton 1: Qualitative Dust Assessment and Construction Dust Management Plan (CDMP).
- **Appendix 17.2** West Burton 2: Qualitative Dust Assessment and Construction Dust Management Plan (CDMP).
- **Appendix 17.3** West Burton 3: Qualitative Dust Assessment and Construction Dust Management Plan (CDMP).
- **Appendix 17.4** Technical Note: Air Quality Assessment on Emission Impact from the Battery Energy Storage Systems (BESS) Fire.

17.1.3 The CDMPs and this chapter has been produced by Tetra Tech (see Statement of Competence).

17.2 Consultation

17.2.1 A summary of consultation is provided in **Table 17.1**.

Table 17.1 Summary of Consultation Responses

Date	Consultee and Response	Action
	PINS Scoping Opinion, Case Reference: EN010132 (Scoping Report Section 19) 3.14 Major Accidents and Disasters	
02 March 2022	Scoping Report paragraph 19.2.1 sets out a list of potential impacts from major accidents and disasters to/from the Proposed Development and where these will be assessed in other Chapters in the ES. Impacts include: Fire and explosion The above impacts are proposed to be assessed in other chapters such as Human Health (Scoping Report paragraph 19.3.1),	Fire incident impact assessment has been undertaken using a detailed air quality dispersion modelling to assess potential smoke effects on the residential receptors of a major solar panel, battery storage and sub-stations fire accident and is presented in Paragraphs 17.7.14 – 17.7.19 and Appendix 17.4.

	<p>however, Human Health is also proposed to be assessed in other chapters, rather than a stand-alone chapter. The ES should not be a 'paperchase' and should clearly signpost where these impacts are assessed in other relevant chapters and where any relevant mitigation measures are secured.</p>	
<p>PINS Scoping Opinion, Case Reference: EN010132 (Scoping Report Section 20) 3.15 Air Quality</p>		
	<p>The Scoping Report seeks to scope out detailed air quality modelling and assessment of effects from construction, although a qualitative dust assessment and a CEMP taking account of Institute of Air Quality Management (IAQM) guidance are proposed.</p> <p>Subject to confirmation that the proposed construction vehicle numbers alone or cumulatively with other proposals on relevant links (e.g. for Cottam Solar Project) will not exceed the relevant IAQM/EPUK thresholds e.g. 100 HGV Annual Average Daily Traffic (AADT), the Inspectorate considers that the need for detailed construction air quality modelling and assessment can be scoped out.</p>	<p>The CEMP [EN010132/APP/WB7.1] has been produced for each of the Sites of: West Burton 1, 2, and 3.</p> <p>Qualitative Dust Assessment and Construction Dust Management Plans (CDMPs) for each of the Sites are included within Appendices 17.1, 17.2, and 17.3.</p> <p>Detailed dispersion modelling assessment of construction vehicles has been scoped out of the ES as detailed in Paragraph 17.4.6.</p>
	<p>Based on the nature of the development and subject to confirmation of the type and number of maintenance vehicles, the Inspectorate considers that operational traffic movements will be limited and that operational traffic air quality modelling may be scoped out.</p>	<p>Assessment of operational vehicles / traffic movements, including detailed dispersion modelling, has been scoped out of the ES, as detailed in Paragraph 17.4.9.</p>

17.3 Policy Context

17.3.1 This section provides an overview of the legislative and planning policy framework against which the Scheme will be considered for air quality. These policies identify the need for a site-specific air quality assessment to consider the impacts of construction, operational and decommissioning phase air quality pollution on local sensitive receptors.

[Legislation](#)

European Legislation

17.3.2 European air quality legislation is consolidated under Directive 2008/50/EC (as amended), which came into force on 11th June 2008. This Directive consolidated and replaced previous legislation which was designed to deal with specific pollutants in a consistent manner and provides new air quality objectives for fine particulates. The consolidated Directive includes:

- Directive 1999/30/EC – the First Air Quality "Daughter" Directive – sets ambient air limit values for nitrogen dioxide (NO₂) and oxides of nitrogen (NO_x), sulphur dioxide (SO₂), lead (Pb) and particulate matter (PM);
- Directive 2000/69/EC – the Second Air Quality "Daughter" Directive – sets ambient air limit values for benzene (C₆H₆) and carbon monoxide (CO); and,
- Directive 2002/3/EC – the Third Air Quality "Daughter" Directive – seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone (O₃) in ambient air.
- The 2008 Ambient Air Quality Directive (2008/50/EC) - The Directive sets limits for key pollutants in the air we breathe outdoors. These legally binding limit values are for concentrations of major air pollutants that impact public health, such as particulate matter (PM₁₀ and PM_{2.5}) and nitrogen dioxide (NO₂). The directive also sets limit values for a range of other pollutants, such as ozone, sulphur dioxide and carbon monoxide.
- Meanwhile, the 4th air quality "Daughter" directive (2004/107/EC) (as amended) sets targets for levels in ambient air, of certain heavy metals and polycyclic aromatic hydrocarbons.
- Both Directives are introduced into the UK through the Air Quality Standards Regulations 2010.

17.3.3 The European Commission (EC) Directive Limits, outlined above, have been transposed in the UK through the Air Quality Standards Regulations 2010. In the UK responsibility for meeting ambient air quality limit values is devolved to the national administrations in Scotland, Wales and Northern Ireland.

National Legislation

Air Quality Standards Regulations 2010 (as amended)

- 17.3.4 The EU directives referred to above are implemented into domestic law by the Air Quality Standards Regulations 2010 (as amended) (Ref.1, Ref.2). The limit values (re ambient air quality) defined within those Regulations are legally-binding and apply across England, with the exception of the carriageway and central reservation of roads where the public does not normally have access, on factory premises or at industrial locations (where health and safety provisions apply) and any locations where the public does not have access and there is no fixed habitation.
- 17.3.5 The Air Quality Standards Regulations 2010 (as amended) set legally binding limits for concentrations of certain air pollutants (i.e. “limit values”). This is with the intention of avoiding, preventing or reducing harmful effects on human health and the environment as a whole. To the extent that any concentrations exceed limit values, the Secretary of State is required to prepare an “air quality plan” with measures so as to achieve the limit value.

The UK Air Quality Strategy

- 17.3.6 The UK Air Quality Strategy (Ref.3) is the method for implementation of the air quality limit values in England, Scotland, Wales and Northern Ireland and provides a framework for improving air quality and protecting human health from the effects of pollution.
- 17.3.7 For each nominated pollutant, the Air Quality Strategy sets clear, measurable, outdoor air quality standards and target dates which should be aimed for; the combined standard and target date is referred to as the Air Quality Objective (AQO) for that pollutant. Adopted national standards are based on the recommendations of the Expert Panel on Air Quality Standards (EPAQS) and have been translated into a set of Statutory Objectives within the Air Quality (England) Regulations 2000.

Environmental Protection Act 1990

- 17.3.8 The Environmental Protection Act 1990^{iv} prescribes a statutory nuisance as air quality pollutants emitted from premises (including land), through smoke, fumes or gases, dust, steam or smell that is prejudicial to health or a nuisance.
- 17.3.9 Local Authorities are required to investigate any public complaints regarding air quality, and if they are satisfied that a statutory nuisance exists, or is likely to occur or recur, they must serve an abatement notice. A notice is served on the person responsible for the nuisance. It requires either simply the abatement of the nuisance or works to abate the nuisance to be carried out, or it prohibits or restricts the activity.

National Planning Policy

- 17.3.10 The following planning policy, legislation, guidance and standards are of particular relevance to air quality:

- Overarching National Policy Statement for Energy (EN-1); including draft revised NPS EN-1 (Ref.5);
- National Policy Statement on Renewable Energy Infrastructure (EN-3); including draft revised NPS EN-3 (Ref.6);
- National Planning Policy Statement for Electrical Networks (EN-5); including draft revised NPS EN-5 (Ref.7);
- The National Planning Policy Framework (NPPF) (Ref.8);
- The National Planning Practice Guidance (PPG) (2019) (Ref.9); and,
- The Clean Air Strategy (2019) (Ref.10).

17.3.11 The overarching NPS for Energy (EN-1) was adopted in July 2011 and sets out the overall national energy policy for delivering major energy infrastructure. Broadly similar provisions are contained in draft revised NPS EN-1.

17.3.12 Paragraphs 5.2.6 and 5.2.7 of EN-1 deals with effects from Air Quality and Emissions, and states:

“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 (ES). 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;*
- *the predicted absolute emission levels of the proposed project, after mitigation methods have been applied;*
- *existing air quality levels and the relative change in air quality from existing levels; and,*
- *any potential eutrophication impacts.”*

17.3.13 With regards to the decision-making process, EN-1 states that air quality considerations should be given substantial weight where a project would lead to a deterioration in air quality in an area or lead to a new area where air quality breaches any national air quality limits (see paragraph 5.2.9).

17.3.14 Where substantial changes in air quality levels are expected, even if this does not lead to any breaches of national air quality limits, air quality considerations will also be important. Any relevant statutory air quality limits must be taken account of in all cases. Additionally, where a project is likely to lead to a breach of such limits, appropriate mitigation measures should be secured (paragraphs 5.2.9 and 5.2.10). A notable insertion in the draft of EN-1 is the requirement for applicants to engage with the relevant local authority where a project is in, or in close proximity to, a Local Air Quality Management Area or Clean Air Zone to ensure compatibility with the local air quality plan.

17.3.15 The National Policy Statement on Electricity Networks Infrastructure 5 (EN-5) was adopted in July 2011. Whilst EN-5 principally covers above-ground electricity lines of 132 kV and above, paragraph 1.8.2 confirms that EN-5 will also be relevant if the electricity network constitutes an associated development for which consent is sought, such as a generating station. EN-5 is therefore relevant to the Scheme, as a grid connection is proposed, however, EN-5 does not reference any specific requirements regarding air quality.

17.3.16 A consultation draft of an updated version of EN-1 has been published. Whilst this is not yet in force, the policies on air quality largely mirror those of the existing EN-1. A notable insertion in the draft is the requirement for applicants to engage with the relevant local authority where a project is in, or in close proximity to, a Local Air Quality Management Area or Clean Air Zone to ensure compatibility with the local air quality plan.

The National Planning Policy Framework (NPPF)

17.3.17 The NPPF, revised most recently in July 2021, sets out the Government's planning policies for England, providing a framework within which local policies can be developed. The key principle of the NPPF is a presumption in favour of sustainable development. The NPPF principally brings together and summarises the suite of Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) which previously guided planning policy making. The PPG now exists to support the NPPF. With regards to air quality, the NPPF states:

17.3.18 Paragraph 174

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans."

17.3.19 Paragraph 186

"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 from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. 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."

17.3.20 Paragraph 188

“The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.”

Planning Practice Guidance

17.3.21 The relevant Guidance Category of Air Quality in the Planning Practice Guidance (PPG) web-based resource was updated by the Ministry for Housing, Communities and Local Government (MHCLG) on 1st November 2019 to support the National Planning Policy Framework and make it more accessible. A review of PPG: Air Quality identified the following guidance (Paragraph: 001 Reference ID: 32-001-20191101):

“The 2008 Ambient Air Quality Directive sets legally binding limits for concentrations in outdoor air of major air pollutants that affect public health such as particulate matter (PM₁₀ and PM_{2.5}) and nitrogen dioxide (NO₂).

- *The UK also has national emission reduction commitments for overall UK emissions of 5 damaging air pollutants:*
- *fine particulate matter (PM_{2.5});*
- *ammonia (NH₃);*
- *nitrogen oxides (NO_x);*
- *sulphur dioxide (SO₂); and*
- *non-methane volatile organic compounds (NMVOCs).*

As well as having direct effects on public health, habitats and biodiversity, these pollutants can combine in the atmosphere to form ozone, a harmful air pollutant (and potent greenhouse gas) which can be transported great distances by weather systems. Odour and dust can also be a planning concern, for example, because of the effect on local amenity.”

17.3.22 Additionally, the PPG states (Paragraph: 005 Reference ID: 32-005-20191101):

“Where air quality is a relevant consideration the local planning authority may need to establish:

- *the ‘baseline’ local air quality, including what would happen to air quality in the absence of the development;*
- *whether the proposed development could significantly change air quality during the construction and operational phases (and the consequences of this for public health and biodiversity); and*

- *whether occupiers or users of the development could experience poor living conditions or health due to poor air quality.”*

Local Planning Policy

- 17.3.23 West Lindsey District Council replaced the West Lindsey Local Plan with the Central Lincolnshire Local Plan in April 2017 following Central Lincolnshire Joint Strategic Planning Committee formally adopting the Plan. The Central Lincolnshire authorities are currently preparing a new Local Plan to replace the Local Plan adopted in 2017.
- 17.3.24 The following policy relevant to air quality is contained with the Adopted Central Lincolnshire Local Plan:

Policy LP26: Design and Amenity

All development, including extensions and alterations to existing buildings, must achieve high quality sustainable design that contributes positively to local character, landscape and townscape, and supports diversity, equality and access for all.

Development proposals will be assessed against the following relevant design and amenity criteria. [...]

Amenity Considerations

The amenities which all existing and future occupants of neighbouring land and buildings may reasonably expect to enjoy must not be unduly harmed by or as a result of development. Proposals should demonstrate, where applicable and to a degree proportionate to the proposal, how the following matters have been considered, in relation to both the construction and life of the development: [...]

a. Adverse impact upon air quality from odour, fumes, smoke, dust and other sources; [...]

- 17.3.25 Following a review of the Proposed Submission Central Lincolnshire Local Plan (Ref.18) (March 2022), the following policy related to Air Quality was identified:

Policy S14: Renewable Energy

The Central Lincolnshire Joint Strategic Planning Committee is committed to supporting the transition to a net zero carbon future and will seek to maximise appropriately located renewable energy generated in Central Lincolnshire (such energy likely being wind and solar based).

Proposals for renewable energy schemes, including ancillary development, will be supported where the direct, indirect, individual and cumulative impacts on the following considerations are, or will be made, acceptable. To determine whether it is acceptable, the following tests will have to be met:

i. The impacts are acceptable having considered the scale, siting and design, and the consequent impacts on landscape character; visual amenity; biodiversity; geodiversity; flood risk; townscape; heritage assets and their settings; and highway safety; and

ii. *The impacts are acceptable on aviation and defence navigation system/communications; and*

iii. *The impacts are acceptable on the amenity of sensitive neighbouring uses (including local residents) by virtue of matters such as noise, dust, odour, shadow flicker, air quality and traffic; [...]*

In order to test compliance with part (iii) above will require, for relevant proposals, the submission by the applicant of a robust assessment of the potential impact on such users, and the mitigation measures proposed to minimise any identified harm.

For all matters in (i)-(iii), the applicable local planning authority may commission its own independent assessment of the proposals, to ensure it is satisfied what the degree of harm may be and whether reasonable mitigation opportunities are being taken. [...]"

Policy S53: Design and Amenity

All development, including extensions and alterations to existing buildings, must achieve high quality sustainable design that contributes positively to local character, landscape and townscape, and supports diversity, equality and access for all.

Good design will be at the centre of every development proposal, and this will be required to be demonstrated through evidence supporting planning applications to a degree proportionate to the proposal. Design Codes may be produced for parts of Central Lincolnshire or in support of specific developments. The approach taken in these Design Codes should be informed by the National Model Design Code and where these codes have been adopted, developments will be expected to adhere to the Code.

Proposals for new buildings should incorporate the Design Principles for Efficient Buildings in Policy S6 at the centre of design.

All development proposals will be assessed against, and will be expected to meet the following relevant design and amenity criteria. All development proposals will: ...

7. Uses

a) Create or contribute to a variety of complementary uses that meet the needs of the community;

b) Be compatible with neighbouring land uses and not result in likely conflict with existing 'bad neighbour' uses unless it can be satisfactorily demonstrated that both the ongoing use of the neighbouring site will not be compromised, and that the amenity of occupiers of the new development will be satisfactory with the ongoing normal use of the neighbouring site;

c) Not result in adverse noise and vibration taking into account surrounding uses nor result in adverse impacts upon air quality from odour, fumes, smoke, dust and other sources. ..."

17.3.26 Bassetlaw District Council have submitted the Bassetlaw Local Plan 2020-2038 Publication Version (July 2022) prior to adoption. The following policy relevant to air quality is contained with the Bassetlaw Local Plan 2020-2038 Publication Version:

POLICY ST44: Promoting Healthy, Active Lifestyles

1. The Council will, with its partners, create an environment which supports healthy, active, inclusive and safe communities. Healthy, active and safe lifestyles will be enabled by: [...]

g) ensuring that the current air quality in the District is maintained and, where possible improved; [...]

POLICY 48: Protecting Amenity

1. Proposals for development should be designed and constructed to avoid and minimise impacts on the amenity of existing and future users, individually and cumulatively, within the development and close to it. As such, proposals will be expected to:

a) not have a significant adverse effect on the living conditions of existing and new residents and future occupiers of the proposed development through loss of privacy, excessive overshadowing or overbearing impact; and

b) not generate a level of activity, noise, light, air quality, odour, vibration or other pollution which cannot be mitigated to an appropriate standard.

2. Proposals for development adjacent to, or in the locality of, existing 'bad neighbour' uses such as waste sites, incinerators, chemical production, heavy industry and businesses with out of normal hour (9-5) operations, will need to demonstrate that:

a) the ongoing use of the neighbouring site is not compromised; and

b) the amenity of future occupiers of the new development can be achieved in accordance with Part 1 of this policy with the ongoing normal use of the neighbouring site;

3. Where the development of a new bad neighbour business or change of use could have a significant adverse effect on residential amenity, appropriate mitigation will be required before the development can be occupied.

POLICY ST50: Reducing Carbon Emissions, Climate Change Mitigation and Adaptation

1. All proposals, including the change of use of existing buildings and spaces, should seek to reduce carbon and energy impacts in their design and construction in accordance with Policy ST35. Proposals should incorporate measures that address issues of climate change mitigation through:

a) ensuring no adverse impact on local air quality; [...]

17.4 Assessment Methodology and Significance Criteria

Construction Assessment Methodology

Construction Phase Dust Assessment

- 17.4.1 The effects during the construction phase have the potential to result in dust nuisance complaints and surface soiling from deposition, as opposed to the risk of exceeding a custom and practice threshold for dust mass deposition of 200 mg m⁻²

day-1 averaged over the period of a month (Good practice guide: control and measurement of nuisance dust and PM₁₀ from the extractive industries, Mineral Industry Research Organisation (MIRO)/AEA Technology plc, 25 February 2011). The effects will be direct as they occur as a result of activities associated with the Scheme, temporary as they will only potentially occur during construction activities, short-term because they will only arise at particular times when certain activities and meteorological conditions for creating the level of magnitude predicted combine and will be reversible.

17.4.2 Additional vehicle movements (particularly HGV movements) associated with the construction phase have the potential to generate exhaust emissions, such as NO₂, PM₁₀ and PM_{2.5} on the local road network.

17.4.3 The effects identified for the construction phase and considered for the purpose of this assessment from (1) on-site construction activities and (2) the associated construction traffic outside of the site boundary are as follows:

On-site construction Activities:

17.4.4 Temporary generation of dust arising from construction works within the site boundary leading to potential impacts on dust soiling and concentrations of particulate matter (as PM₁₀) and the study areas are set up in accordance with the IAQM document (Guidance on the assessment of dust from demolition and construction, January 2014 (Ref.11)), and are as follows:

- For human receptors:
 - 350m of the boundary of each site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from each of the site entrances(s).
- For dust sensitive ecological receptors:
 - 50m of the boundary of each site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from each of the site entrances(s).

17.4.5 Appropriate site-specific mitigation for the on-site construction activities has been recommended in accordance with the IAQM document (Guidance on the assessment of dust from demolition and construction, January 2014 (Ref.11)) and is included within the Outline CEMP **[EN010132/APP/WB7.1]** accompanying the DCO application, for the proposed Scheme, which will mitigate any potential adverse effects associated with the construction phase of the development. Following the implementation of the mitigation, it is expected there will be a 'negligible' impact as a result of the Scheme.

[Assessment of Receptor Sensitivity](#)

17.4.6 Receptors can demonstrate different sensitivities to changes in their environment. For the purpose of this assessment, sensitivity will be determined as Very High, High,

Medium, Low or Negligible, as detailed in **Table 17.2** for the construction phase of the development.

Table 17.2 Methodology for Assessing Sensitivity of Receptor for Construction Phase Dust Impact

Sensitivity	Definition
Very High	Receptors of very high sensitivity to dust, such as: hospitals and clinics, retirement homes, painting and furnishing, hi-tech industries and food processing (Construction). Densely populated areas – more than 100 dwellings within 20m of the development site (Construction).
High	Receptors of high sensitivity to dust, such as: schools, residential areas, food retailers, glasshouses and nurseries, horticultural land and offices (Construction). Densely populated areas – 10-100 dwellings within 20m of the development site (Construction).
Medium	Receptors of medium sensitivity to dust, such as: farms, outdoor storage, light and heavy industry (Construction). Suburban or edge of town areas (Construction).
Low	All other dust sensitive receptors not identified above (Construction). Rural/Industrial areas (Construction).
Negligible	Receptor more than 350m away (construction)

17.4.7 For the Potential Air Quality Impact Assessment From A Fire Incident (**Appendix 17.4 [EN010132/APP/WB6.3.17.4]**), all receptor locations assessed are considered to be of 'High' Sensitivity, to be representative of residential dwellings in proximity to the sites.

Associated Construction Traffic outside of the Site Boundary

17.4.8 The anticipated worst-case (combined West Burton 1, 2, 3 and BESS) peak Day vehicle movements associated with the Scheme during the construction phase are forecast to be 46 HGV movements, and 326 car and LGV movements, as detailed within **Chapter 14: Transport and Access [EN010132/APP/WB6.2.14]**. Therefore, the heavy-duty vehicle (HDV) movements on the local road network will not be greater than 100 annual average daily traffic (AADT) and the light duty vehicle (LDV) will not be greater than 500 AADT. Therefore, as the Sites are not located within or adjacent to an AQMA, the construction traffic air quality impact can be scoped out, in accordance with the 'Indicative criteria for requiring an air quality assessment' in IAQM Guidance within Land-use planning & development control: Planning for air quality, June 2016 (Ref.12).

- 17.4.9 Additionally, the calculated construction traffic numbers are considered to be overly robust, where the cumulative movements associated with West Burton 1, 2, and 3 have been uplifted to account for a peak construction period, therefore a worst-case scenario, which would not be experienced year-round. Furthermore, considering the worst-case nature of the predicted vehicle movements, and the low concentrations of air quality pollutants in the vicinity of the scheme, it has been determined that the construction vehicles will not result in a significant impact on air quality during the construction phase.

[Construction Significance Criteria](#)

Construction Dust Significance Criteria

- 17.4.10 The IAQM Guidance does not assign a significance criterion prior to the implementation of mitigation measures, instead it assigns a 'risk factor' to determine the level of site-specific mitigation measures which should be implemented as part of the Scheme. Further details on the calculation of the 'risk factors' for each site are detailed in **Appendices 17.1, 17.2, and 17.3 [EN010132/APP/WB6.3.17.1 – WB6.3.17.3]**.

[Operational Phase Assessment Methodology](#)

- 17.4.11 The operational traffic associated with the scheme is expected to be very low. Solar farm developments do not generate significant traffic flows once operational. Typically, there will be only a handful of trips per month by Transit Van (or similar) for maintenance purposes (less than 1 vehicle trip per day on average). In addition it is not anticipated that the effects associated with decommissioning will be worse than during the construction phase. It is anticipated that the number of vehicle and heavy-duty vehicle (HDV) movements on the local road network will not be greater than the light duty vehicle (LDV) movements (500 AADT). As the Sites are not located within or adjacent to an AQMA, the traffic air quality impact can be scoped out, according to the "Indicative criteria for requiring an air quality assessment" in IAQM Guidance of Land-use planning & development control: Planning for air quality, January 2017 (Ref.12).
- 17.4.12 The Scheme does not include any fixed plant which may give rise to emissions, such as Combined Heat and Power (CHP) or boilers, therefore there are not emissions associated with the proposed Scheme and the direct impacts on air quality are determined to be 'imperceptible'.
- Fire Incident Impact Assessment**
- 17.4.13 The EIA Regulations (Ref.13) has introduced a requirement to consider major accidents or disasters. It is considered likely that the original changes to the EIA Directive (Ref.14) to consider major accidents or disasters were made in order to bring certain other statutory requirements, mainly other EU Directives, within the overall 'wrapper' of EIA and the ES. The Directive and domestic Regulations cite two specific directives as examples of risk assessments to be brought within EIA, these are Directive 2012/18/EU of the European Parliament and of the European Council

(which deals with major accident hazard registered sites and Council Directive 2009/71/Euratom (which deals with nuclear sites) (Ref.15). Neither of these Directives are relevant to the Scheme.

- 17.4.14 'Accidents' are considered to be an occurrence resulting from uncontrolled developments in the course of construction and operation of a development (e.g. major emission, fire or explosion). 'Disasters' are considered to be naturally occurring extreme weather events or ground related hazard events (e.g. subsidence, landslide, earthquake).
- 17.4.15 In the absence of established guidance on this topic, the following methodology has been adopted. In general, major accidents or disasters, as they relate to the Scheme, fall into three categories:
- Events that could not realistically occur, due to the nature of the Scheme or its location;
 - Events that could realistically occur, but for which the Scheme, and associated receptors, are no more vulnerable than any other development; and
 - Events that could occur, and to which the Scheme is particularly vulnerable, or which the Scheme has a particular capacity to exacerbate.
- 17.4.16 The potential impacts on local residents from a fire accident, such as solar panel, battery storage and sub-stations fire, are considered and assessed. Particulate matter exposure is the key principle public health threat from short-term smoke exposure, therefore, detailed air dispersion modelling of particulate matter impact from smoke has been undertaken to predict the short-term concentrations of PM₁₀ and PM_{2.5} at residential receptors at downwind locations likely to be affected by incidents including fire.
- 17.4.17 Detailed air quality dispersion modelling has been undertaken to generate background concentrations which are required to inform the assessment of Air Quality Impact from a Major Fire Accident.
- 17.4.18 An approved atmospheric dispersion modelling package (ADMS-Roads) has been used in the Air Quality Impact Assessment of a Major Fire Accident, where, smoke levels and their associated air quality category (good to hazardous level) will be estimated using the modelled predicted particulate matter levels, and the potential smoke effects on residential and other sensitive receptors are assessed and mitigation measures are discussed where appropriate.
- 17.4.19 Health effects of fire smoke exposures are assessed for the protection of human health. The guidelines within '*Smoke Exposure from Wildland fires, interim Guidelines for Protecting community Health and wellbeing*', Manitoba Health, Canada (January 26, 2012) (Ref.16), are considered to be the most relevant to inform the assessment. The guidelines are used to estimate the smoke levels and air quality category (good to hazardous) using the predicted particulate matter levels displayed in **Table 17.2** which provides an approximated conversion between visibility through smoke, as a

visibility index provides a quick, alternative way to estimate smoke levels. Using landmarks at known distances, an experienced observer can provide a reasonable estimate of particle concentration.

Air quality is a measure of how clean or polluted the air is. For this assessment air quality has been divided into 5 categories from good (healthy) to hazardous using the particulate matter levels in air. Visibility affected by particulate matter is also discussed in **Table 17.3** below.

Table 17.3 Estimating Smoke Levels from Particulate Matter Concentrations

Air Quality Category	Equivalent approx. PM _{2.5} 1-3-hour average in µg/m ³	Visibility in km
Good	0 - 40	15 km and over
Moderate/Unhealthy for Sensitive Groups	41 - 175	5 - 14 km
Unhealthy	176 - 300	2.5 - 4 km
Very Unhealthy	301 - 500	1.5 - 2 km
Hazardous	over 500	Less than 1 km

Assessment of Significance

Fire Incident Impact Assessment

- 17.4.20 The Guidance relating to Fire Incident Impacts Assessment does not assign a significance criterion, and instead is used to recommend measures to be included within an Action Plan for protecting human life from fire smoke. Further details on the assessment and measures for each site are detailed in **Appendix 17.4 [EN010132/APP/WB6.3.17.4]**.

17.5 Baseline Conditions

- 17.5.1 This section provides a review of the existing air quality in the vicinity of the application site and the study areas in order to provide a benchmark against which to assess potential air quality impacts of the proposed development. Baseline air quality in the vicinity of the application site has been defined from several sources, as described in the following sections.

Local Air Quality Management (LAQM)

- 17.5.2 The Scheme Sites, and part of the Cable Route Corridor are located in West Lindsey district. As required under Section 82 of the Environment Act 1995, West Lindsey District Council (WLDC) reviews and assesses air quality within its area of jurisdiction. The assessments have indicated that concentrations of air quality pollutants are not above the relevant AQOs at any locations of relevant public exposure within the district. Therefore, WLDC has not designated any Air Quality Management Areas (AQMAs).
- 17.5.3 In respect of any cumulative assessment, notably, some of the proposed Sites (including the cable corridors) for the Cottam Solar Project are located within West Lindsey District Council, Lincolnshire County Council, Bassetlaw District Council (BDC), and Nottinghamshire County Council. BDC also review and assess air quality within its area of jurisdiction. The assessments have indicated that concentrations of air quality pollutants are not above the relevant AQOs at any locations of relevant public exposure within the district. Therefore, BDC has not designated any Air Quality Management Areas (AQMAs).

Air Quality Monitoring

- 17.5.4 Monitoring of air quality within WLDC has been undertaken through both automatic and non-automatic monitoring methods in 2019. Automatic methods consists of Automatic analysers continuously drawing in ambient (outdoor) air and measure the concentration of the pollutant in the sampled air. Non-automatic Networks measure less frequently compared to automatic networks - either daily, weekly or monthly - and samples are collected by some physical means (such as diffusion tube or filter). These samples are then subjected to chemical analysis, and final pollutant concentrations calculated from these results. These have been reviewed in order to provide an indication of existing air quality in the area surrounding the application site. WLDC publishes the monitoring data annually and at the time of this

assessment the most recently available, representative monitoring data within WLDC was undertaken during 2019. Due to the distance of BDC monitoring data, WLDC monitoring is determined to be most representative.

Automatic Monitoring

- 17.5.5 WLDC undertook automatic pollution monitoring during 2019 at 4 different locations. The closest monitoring location to the proposed development Site is named as GC, which is located at Gainsborough Cemetery. The most recent available, representative data is from 2019 which is presented in **Table 17.4** and **Figure 17.1**.

Table 17.4 Monitored Annual Mean NO₂ Concentrations at Automatic Monitoring Locations

Site ID	Location	Site Type	Distance from Kerb of Nearest Road (m)	Inlet Height (m)	2019 NO ₂ Annual Mean Concentration (µg/m ³)
GC	Gainsborough Cemetery	Industrial	N/A	3.0	7.5

- 17.5.6 As outlined in **Table 17.4**, GC monitoring location monitored annual average concentrations below the AQO for NO₂ (40 µg/m³ annual mean) during 2019. Neither WLDC or BDC undertake any monitoring of PM₁₀ or PM_{2.5}.

Non - Automatic Monitoring

- 17.5.7 WLDC operated a network of 86 passive diffusion tubes during 2019. The most recently available, representative diffusion tube data is from 2019 which is presented in **Table 17.5** and **Figure 17.1**.

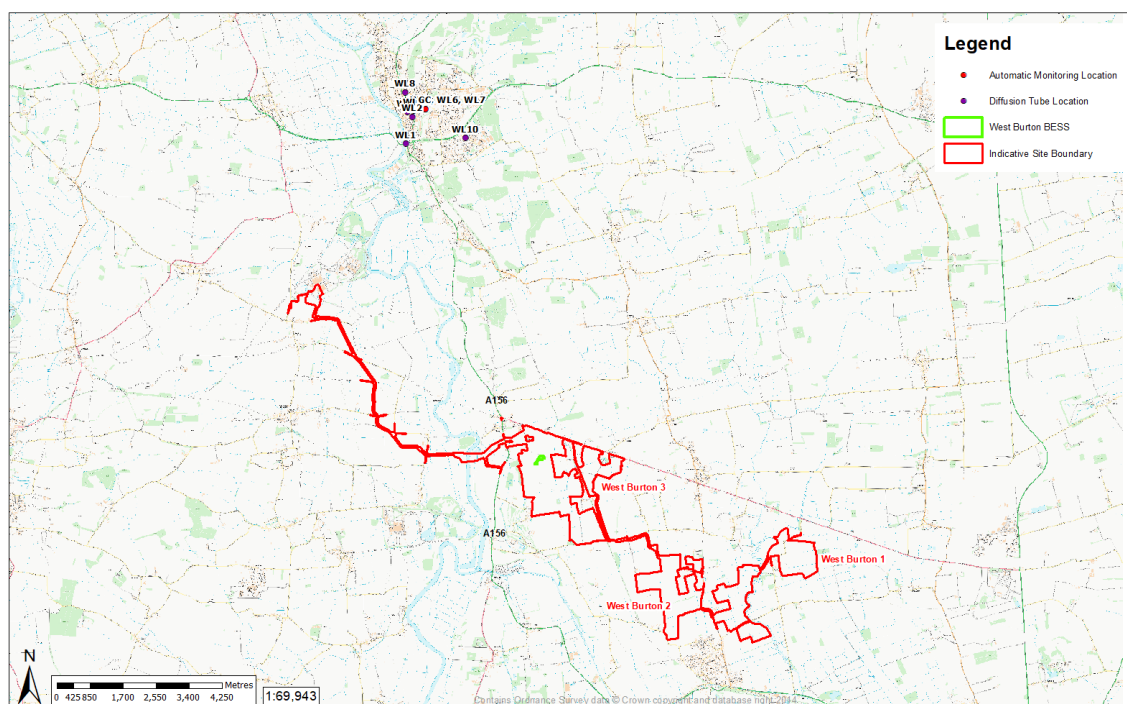
Table 17.5 Monitored Annual Mean NO₂ Concentrations at Diffusion Tubes

Site ID	Location	Site Type	Distance from Kerb of Nearest Road (m)	Inlet Height (m)	2019 NO ₂ Annual Mean Concentration (µg/m ³)
WL1	3 Lea Road, Gainsborough	Roadside	8.6	2.8	22.8

WL2	58 Etherington Street, Gainsborough	Roadside	1.6	2.8	19.0
WL3	19 Spring Gardens, Gainsborough	Roadside	2.9	2.8	17.3
WL4	Heaton Street	Roadside	2.2	2.8	20.7
WL5, WL6, WL7	Gainsborough Cemetery, Gainsborough	Industrial	13.8	3.0	11.3
WL8	Cherry Tree, Gainsborough	Kerbside	0.2	2.8	14.7
WL10	Marshall Way, Gainsborough	Roadside	15.9	2.8	15.0

17.5.8 As indicated in **Table 17.5**, all diffusion tubes located within the Air Quality Assessment area monitored annual average NO₂ concentrations below the AQO for NO₂ (40 µg/m³ annual mean) during 2019.

Figure 17.1 West Lindsey Monitoring Locations



Future Baseline

- 17.5.9 2019 baseline conditions assessed are deemed to be appropriate and representative for application site conditions at the commencement of works.
- 17.5.10 It should be noted that over time, the number of petrol/diesel cars are predicted to reduce as a result of initiatives to combat air pollution and so emissions associated with vehicles will reduce over time. This would be as a result of greater numbers of electric vehicles making up the fleet and there being fewer older more polluting vehicles on the road. As a worst case, the assessment considered that background concentrations will not improve between the baseline year and the assessed future years, and the same background concentrations were utilised.

Background Pollutant Mapping

- 17.5.11 The use of background concentrations within the modelling process ensures that pollutant sources other than traffic are represented appropriately. Background sources of pollutants include industrial, domestic and rail emissions within the vicinity of the study site. Several sources have been used to obtain representative background levels as discussed below.
- 17.5.12 The background concentrations used within the assessment have been determined with reference to the IAQM Guidance and Technical Guidance (TG) (16).
- 17.5.13 The IAQM Guidance states:
“A matter of judgement should take into account the background and future background air quality and whether it is likely to approach or exceed the value of the AQO.”
- 17.5.14 Additionally, TG (16) states:
“Typically, only the process contributions from local sources are represented within an output by the dispersion model. In these circumstances, it is necessary to add an appropriate background concentration(s) to the modelled source contributions to derive the total pollutant concentrations.”
- 17.5.15 All the Defra background concentrations detailed in **Table 17.6** for 2019, show that the background levels are predicted to be below the relevant AQO within the study area.
- 17.5.16 The relevant background concentrations for this assessment are shown in **Table 17.8**, which were obtained from the UK National Air Quality Information Archive database based on the National Grid Co-ordinates of 1 x 1 km grid squares nearest to the application site. Those background data was published by Defra in a data group named as “Background Maps 2018” for nitrogen oxide (NO_x), NO₂, PM₁₀ and PM_{2.5} in August 2020.

Table 17.6 Published Background Air Quality Levels ($\mu\text{g}/\text{m}^3$)

Council	Area	UK NGR (m)		2021 Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)			
		X	Y	NO _x	NO ₂	PM ₁₀	PM _{2.5}
West Lindsey District	West Burton 1 & 2	489500	377500	9.40	7.31	15.76	8.49
West Lindsey District	West Burton 3	485500	380500	9.31	7.24	15.59	8.45
Bassetlaw District Council & West Lindsey District	West Burton Cable Corridor	474500	389500	8.80	6.88	15.20	8.20
Bassetlaw District Council & West Lindsey District		478500	388500	9.38	7.30	15.37	8.36

17.5.17 All the Defra background concentrations detailed in **Table 17.6** for 2021, show that the background levels were predicted to be below the relevant AQO within the study area. It should be noted that using 2021 background data would produce a worst-case assessment as background data after 2021 would be less than 2021 data as Defra data includes the year-on-year decrease in the data base.

Assessment Locations

Discrete (Individual) Receptors

Receptors for Qualitative Dust Assessment and Construction Dust Management Plan (CDMP)

- For human receptors:
 - 350m of the boundary of each site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from each of the site entrance(s).
- *The study area for ecological receptors:*
 - 50m of the boundary of each site; or

- 50m of the route(s) used by construction vehicles on the public highway, up to 500m from each of the site entrance(s).

Table 17.7 Sensitivity of Study Area – West Burton 1

Source	Area Sensitivity					
	Dust Soiling	Site Sensitivity Criteria	Health Effects of PM ₁₀	Site Sensitivity Criteria	Ecological	Site Sensitivity Criteria
Demolition	N/A	No demolition required	N/A	No demolition required	N/A	No demolition required
Earthworks	Medium	10-100 Highly Sensitive Receptors within 50m of the site	Low	Annual Mean of <24 ug/m ³ for PM ₁₀ 10-100 Highly Sensitive Receptors within 50m of the site	N/A	>50 m from site boundary
Construction	Medium		Low		N/A	
Trackout	Medium	10-100 Highly Sensitive Receptors within 50m of roads within 500m of site	Low	Annual Mean of <24 ug/m ³ for PM ₁₀ 10-100 Highly Sensitive Receptors within 50m of roads within 500m of site	N/A	>50 m from site boundary

Table 17.8 Sensitivity of Study Area – West Burton 2

Source	Area Sensitivity					
	Dust Soiling	Site Sensitivity Criteria	Health Effects of PM ₁₀	Site Sensitivity Criteria	Ecological	Site Sensitivity Criteria
Demolition	N/A	No demolition required	N/A	No demolition required	N/A	No demolition required
Earthworks	Medium	10-100 Highly Sensitive Receptors within 50m of the site	Low	Annual Mean of <24 ug/m ³ for PM ₁₀ 10-100 Highly Sensitive Receptors within 50m of the site	N/A	>50 m from site boundary
Construction	Medium		Low		N/A	
Trackout	Medium	10-100 Highly Sensitive Receptors within 50m of roads within 500m of site	Low	Annual Mean of <24 ug/m ³ for PM ₁₀ 10-100 Highly Sensitive Receptors within 50m of roads within 500m of site	N/A	>50 m from site boundary

Table 17.9 Sensitivity of Study Area – West Burton 3

Source	Area Sensitivity					
	Dust Soiling	Site Sensitivity Criteria	Health Effects of PM ₁₀	Site Sensitivity Criteria	Ecological	Site Sensitivity Criteria
Demolition	N/A	No demolition required	N/A	No demolition required	N/A	No demolition required
Earthworks	Medium	10-100 Highly Sensitive Receptors within 50m of the site	Low	Annual Mean of <24 ug/m ³ for PM ₁₀ 10-100 Highly Sensitive Receptors within 50m of the site	N/A	>50 m from site boundary
Construction	Medium		Low		N/A	
Trackout	Medium	10-100 Highly Sensitive Receptors within 50m of roads within 500m of site	Low	Annual Mean of <24 ug/m ³ for PM ₁₀ 10-100 Highly Sensitive Receptors within 50m of roads within 500m of site	N/A	>50 m from site boundary

[Receptors for Fire Impact Assessment](#)

17.5.18 Considering the nature of a fire incident, a fire could be taking place anywhere within the Site and it would be a short period before being extinguished, therefore, a set of generic receptor locations has been defined to assess the potential fire impacts on the fire downwind locations. Four sets of receptor locations have been selected to assess the smokes to spread 4 directions: south, north, east and west.

- Receptor Set 1: Receptor locations affected by west wind (coming from the west and blowing toward the east), A series of 20 receptors, which were spaced at 10 m intervals, are defined eastward away from the fire.
- Receptor Set 2: Receptor locations affected by east wind (coming from the east and blowing toward the west), A series of 20 receptors, which were spaced at 10 m intervals, are defined westward away from the fire.
- Receptor Set 3: Receptor locations affected by south wind (coming from the south and blowing toward the north), A series of 20 receptors, which were spaced at 10 m intervals, are defined northward away from the fire.
- Receptor Set 4: Receptor locations affected by north wind (coming from the north and blowing toward the south), A series of 20 receptors, which were spaced at 10 m intervals, are defined southward away from the fire.

17.5.19 With it not being feasibly possible to evaluate potential fire effects from every possible location of fire at all existing sensitive receptors surrounding the West Burton 1, 2, and 3 Sites., a set of generic locations have been used to represent potential receptors for West Burton 1 site as well and being representative of

potential receptors at West Burton 2 and 3. Therefore, receptor locations have been selected to produce a representative assessment from any location within the Scheme.

The selected generic receptor locations using West Burton 1 site OS coordinates as an example, are presented in **Table 17.10** and **Figure 17.2**.

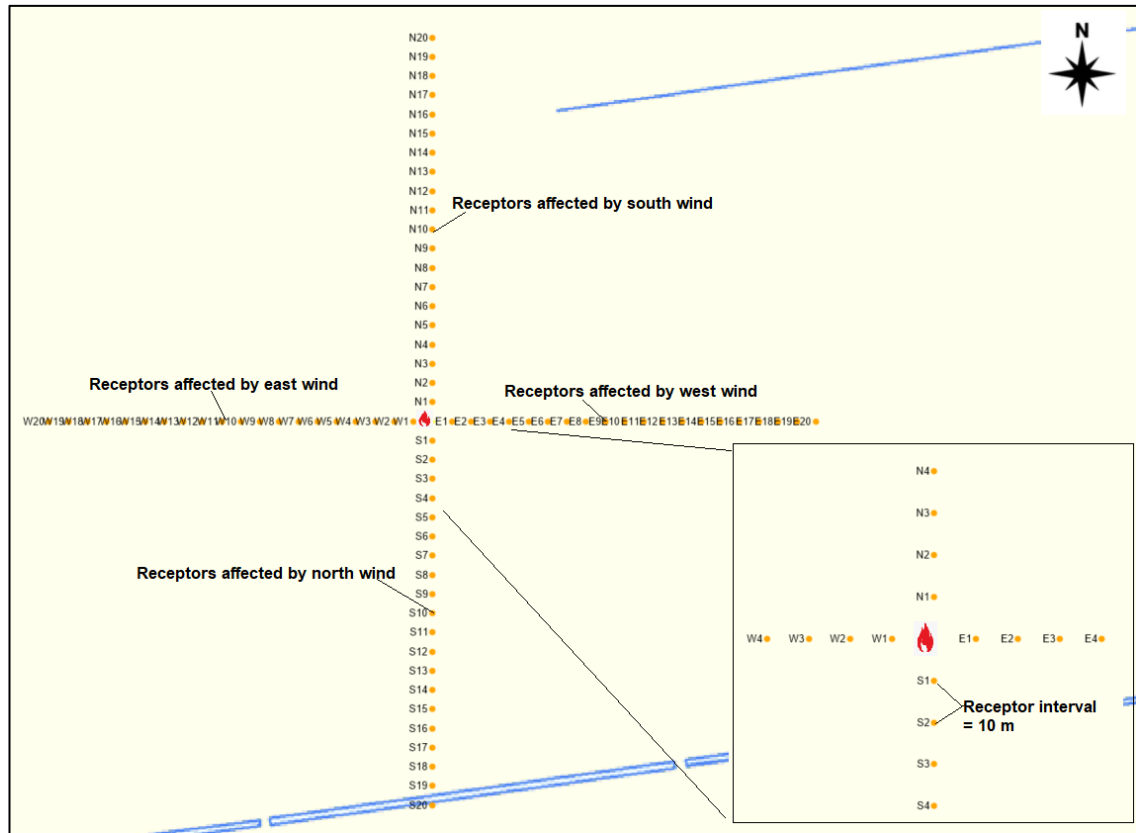
Table 17.10 Selected Sensitive Receptor Locations

Discrete Sensitive Receptor		UK NGR (m)	
		X	Y
E1	Affected by a West Wind	491610	378400
E2		491620	378400
E3		491630	378400
E4		491640	378400
E5		491650	378400
E6		491660	378400
E7		491670	378400
E8		491680	378400
E9		491690	378400
E10		491700	378400
E11		491710	378400
E12		491720	378400
E13		491730	378400
E14		491740	378400
E15		491750	378400
E16		491760	378400
E17		491770	378400
E18		491780	378400
E19		491790	378400
E20		491800	378400
W1	Affected by an East Wind	491590	378400
W2		491580	378400
W3		491570	378400
W4		491560	378400
W5		491550	378400

W6		491540	378400
W7		491530	378400
W8		491520	378400
W9		491510	378400
W10		491500	378400
W11		491490	378400
W12		491480	378400
W13		491470	378400
W14		491460	378400
W15		491450	378400
W16		491440	378400
W17		491430	378400
W18		491420	378400
W19		491410	378400
W20		491400	378400
N1	Affected by a South Wind	491600	378410
N2		491600	378420
N3		491600	378430
N4		491600	378440
N5		491600	378450
N6		491600	378460
N7		491600	378470
N8		491600	378480
N9		491600	378490
N10		491600	378500
N11		491600	378510
N12		491600	378520
N13		491600	378530
N14		491600	378540
N15		491600	378550
N16		491600	378560
N17		491600	378570
N18		491600	378580

N19		491600	378590
N20		491600	378600
S1	Affected by a North Wind	491600	378390
S2		491600	378380
S3		491600	378370
S4		491600	378360
S5		491600	378350
S6		491600	378340
S7		491600	378330
S8		491600	378320
S9		491600	378310
S10		491600	378300
S11		491600	378290
S12		491600	378280
S13		491600	378270
S14		491600	378260
S15		491600	378250
S16		491600	378240
S17		491600	378230
S18		491600	378220
S19		491600	378210
S20		491600	378200

Figure 17.2 Selected Sensitive Receptor Locations



17.6 Embedded Mitigation

17.6.1 The way that potential environmental impacts have been or will be avoided, prevented, reduced, or off-set through design and/or management of the Scheme are outlined below and will be taken into account as part of the assessment of the potential effects. Proposed environmental enhancements are also described where relevant. The mitigation measures for both the construction/decommissioning and operational phases, are outlined below.

Construction and Decommissioning

17.6.2 Measures to control construction and decommissioning dust as defined in IAQM's guidance will be adopted, where reasonably practicable. The appropriate site-specific mitigation measures will be determined through the construction phase dust assessment and included within the Outline CEMP [EN010132/APP/WB7.1]. This will be secured through a DCO Requirement. Site-specific construction dust mitigation has been detailed in the Qualitative dust assessment and construction dust management plans (CDMP's) for the Sites at **Appendices 17.1 - 17.3 [EN010132/APP/WB6.3.17.1 - WB6.3.17.3]**.

17.6.3 Health and Safety on-site would be managed by the contractor during construction and decommissioning to mitigate the risk of fire. Components and equipment for

the Scheme will be installed in accordance with the relevant Fire Regulations and guidance from the Health and Safety Executive. The operational phase of the Scheme will include routine maintenance and servicing of equipment to ensure the safe operation of equipment, and reduce the risk of fire during the decommissioning phase. Fire equipment and notices will also be provided on-site for the availability of personnel and will be regularly inspected and serviced in accordance with relevant Fire Regulations.

Operational Phase

- 17.6.4 There is a potential fire risk associated with certain types of batteries such as lithium ion. The Scheme design includes cooling systems which are designed to regulate temperatures to within safe conditions to minimise the risk of fire. The battery technologies on which the design is based details the following with regards to fire protection:
- The manufacturer undertakes extensive testing and analysis to assess fire risk;
 - Do not install batteries where temperatures routinely approach or exceed 80°C – this is not the case with the Scheme;
 - Do not install batteries near heating equipment or heat sources – this is not the case with the Scheme;
 - Protect the installation area and equipment from flooding, which may cause electrical fires. The risk of flooding has been assessed within **Chapter 10 of the ES Hydrology, Flood Risk and Drainage [EN010132/APP/WB6.2.10]** and mitigation measures to protect it from flooding have been recommended which will be developed as part of the detailed design; and
 - Ensure that installation areas comply with appropriate local fire, electrical and building code requirements, including access to fire trucks in case of emergency. This would be the case with the Scheme.
- 17.6.5 Fire detection and suppression features will be installed to detect (e.g., multispectral infrared flame detectors) and suppress fire (e.g. water-based suppression systems) to minimise the effect of any fire. Batteries will be installed in single locked steel containers which would contain a fire and reduce the likelihood of fire spreading. The Scheme design will include adequate separation between battery banks to ensure that an isolated fire would not become widespread and lead to a major incident.
- 17.6.6 With the above embedded mitigation, any potential risk of fire and the resulting effects would be reduced as far as possible. However, an **Outline Battery Fire Safety Management Plan [EN010132/APP/WB7.9]** has been produced for the Scheme and submitted with the DCO application. The Outline Battery Fire Safety Management Plan has been informed by **Appendix 17.4 [EN010132/APP/WB6.3.17.4]** Potential Air Quality Impact Assessment From A Fire Incident report. This will be secured through a DCO Requirement.

17.7 Identification and Evaluation of Likely Significant Effects

Construction Phase Dust

- 17.7.1 The potential effects during the construction phase include fugitive dust emissions from site activities, such as demolitions, earthworks, construction and trackout, have been assessed in accordance with guidance in the Institute of Air Quality Management's (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction, 2014.
- 17.7.2 Construction activities could give rise to short term elevated dust and/or PM₁₀ concentrations within the vicinity of the Site. This may arise from construction activities, vehicle movements, soiling of the public highway, or windblown stockpiles. Assessment of the potential effects of construction has been undertaken within 50m of the Site boundary, and 50m of roads within 500m radius of the Site.
- 17.7.3 The main emissions during construction works are likely to be dust and particulate matter generated during excavation, earth moving (particularly during dry months), or from construction materials.
- 17.7.4 The main potential effects of particulates/dust are:
- Visual – dust plume, reduced visibility, coating and soiling of surfaces leading to annoyance, loss of amenity, the need to clean surfaces;
 - Physical and/or chemical contamination and corrosion of artefacts;
 - Coating of vegetation and soil contamination; and,
 - Health impacts due to inhalation, e.g. asthma or irritation of the eyes.
- 17.7.5 Factors, such as the amount of precipitation and other meteorological conditions, distance from the source, and the type of activity taking place, will also influence the amount of particulate matter generated.
- 17.7.6 The UK Air Quality Standards seek to control the health implications of respirable particulate matter PM₁₀ (less than 10 micrometres (µm) in diameter). However, the majority of particles released from construction works will be greater than this in size. Particles greater than 10µm are likely to settle out relatively quickly and may cause annoyance due to their soiling capability. There are no formal standards or criteria for nuisance caused by deposited particles, however, a deposition rate of 200mg/m²/day is often presented as a threshold for serious nuisance though this is usually only applied to long term exposure as people are generally more tolerant of dust for a short or defined period. Significant nuisance is likely when the dust coverage of surfaces is visible in contrast with adjacent clean areas, especially when it happens regularly. Severe dust nuisance occurs when the dust is perceptible without a clean reference surface.
- 17.7.7 Three CDMPs have been prepared for West Burton Sites 1, 2 & 3.
- 17.7.8 Effects of construction dust impact on the human receptors and ecological receptors for West Burton Sites 1, 2 & 3 are presented in **Table 17.11**, **Table 17.12**, and **Table**

17.13 respectively, as a risk factor to determine the appropriate mitigation measures to be implemented on-site. The assessment of the effects of construction dust on human health and ecological receptors include the West Burton Sites and the Cable Route Corridor.

Table 17.11 Impact Description of Construction Activities without Mitigation – West Burton 1

Source	Summary Risk of Impacts Prior to Mitigation		
	Dust Soiling	Health Effects of PM ₁₀	Ecological
Demolition	N/A	N/A	N/A
Earthworks	Medium	Low	N/A
Construction	Medium	Low	N/A
Trackout	Medium	Low	N/A

Table 17.12 Impact Description of Construction Activities without Mitigation – West Burton 2

Source	Summary Risk of Impacts Prior to Mitigation		
	Dust Soiling	Health Effects of PM ₁₀	Ecological
Demolition	N/A	N/A	N/A
Earthworks	Medium	Low	N/A
Construction	Medium	Low	N/A
Trackout	Medium	Low	N/A

Table 17.13 Impact Description of Construction Activities without Mitigation – West Burton 3

Source	Summary Risk of Impacts Prior to Mitigation		
	Dust Soiling	Health Effects of PM ₁₀	Ecological
Demolition	N/A	N/A	N/A
Earthworks	Medium	Low	N/A
Construction	Medium	Low	N/A
Trackout	Medium	Low	N/A

17.7.9 The ‘risk factor’ associated with demolition is not applicable as there is no demolition included within the scheme.

17.7.10 It should be noted that the risk relating to ecological receptor locations is determined to be N/A where ecological receptors are not located within 50 m of the application boundary, in accordance with the IAQM Guidance.

17.7.11 The effects during the construction works are predicted with regard to the potential for dust nuisance complaints and surface soiling events due to deposition, as

opposed to the risk of exceeding any Air Quality Objective (AQO). All dust effects are considered to be direct, temporary, short-term and reversible in nature. The effects are determined to be direct as they occur as a result of activities associated with the Scheme, temporary as they will only potentially occur during the construction works, short-term because these will only arise at particular times when certain activities and meteorological conditions for creating the level of magnitude predicted combine, and reversible upon cessation of construction works.

- 17.7.12 The assessment of dust and/or PM₁₀, which is undertaken qualitatively using professional judgement, utilises the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (January 2014) and Part 1 LA105 Air Quality of the Volume 11 Section 3 of the Design Manual for Roads and Bridges (Ref.17).
- 17.7.13 The Applicant's consultants have adapted guidance from the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction' published in 2014. In total, four stages are considered, namely demolition, earthworks, construction and trackout. For each of these phases, the significance of the potential dust is derived following the determination of a dust emission magnitude and the distance of activities to the nearest sensitive receptor, therefore the worst-case is assessed.
- 17.7.14 Following the implementation of the appropriate site-specific mitigation measures, included within the Outline CEMP, the significance of the effects from dust and PM₁₀ emissions associated with the construction works is considered to be negligible on all receptors which is not significant in EIA terms. This is based on the IAQM Guidance. All effects are considered to be temporary, direct, adverse and short term.

Operational Phase – Fire Incident Impact Assessment

- 17.7.15 Effect of a fire incident on the surrounding residents and public has been assessed using the 'air quality category' which is classified from 'good', 'moderate', 'unhealthy', 'very unhealthy' to 'hazardous'. Each category corresponds to a different level of health concern. The air quality category in this assessment is classified using the values of the fire-generated particulate matter (equivalent to PM_{2.5}) concentrations in air. Furthermore, air quality category zones have been determined according to the air quality category to make it easy for public/site manager/fire safety representative to quickly take appropriate actions in case of a fire.
- 17.7.16 Four air quality category zones have been identified:
- **Hazardous Zone** – within 10m of a fire;
 - **Unhealthy Zone** – 11 to 20 m away from a fire;
 - **Moderate/Unhealthy for Sensitive Groups Zone** – 21 to 200 m away from a fire; and
 - **Good air quality Zone** – more than 200 m away from a fire.

- 17.7.17 In the case of a fire, a site manager/fire safety representative will need to assess the fire location, wind direction and surrounding receptors, and will take appropriate actions accordingly.
- 17.7.18 An 'Air Quality Assessment on Emission Impact from the Battery Energy Storage Systems (BESS) Fire' has been undertaken and included at **Appendix 17.4 [EN010132/APP/WB6.3.17.4]** of the ES. Based on the factors of distance to the nearest property, the short-term nature of a fire incident, guidance from the National Fire Chiefs Council (NFCC), and the assessment undertaken, it is concluded that there will not be adverse effects at the closest receptor locations as a result of a BESS fire incident at the proposed development.
- 17.7.19 Whilst there is low risk of adverse effects at the closest receptors, in the case of a BESS fire at the proposed development, good practice safety measures will be implemented. The actions to be taken include:
1. to inform any potential affected residents within the zones and to advise the public about health effects of smoke, related symptoms, and ways to reduce exposure;
 2. to cancel outdoor events; and
 3. to move affected residents to a cleaner air location.
- 17.7.20 Following the implementation of these measures during an occurrence of fire incident, the effects are determined to be negligible which is not significant in EIA terms.

17.8 Mitigation Measures

- 17.8.1 The site-specific construction dust mitigation has been detailed in **Appendices 17.1 – 17.3 [EN010132/APP/WB6.3.17.1 – WB6.2.17.3]** (Qualitative dust assessments and construction dust management plans for West Burton Sites 1, 2 & 3).
- 17.8.2 The appropriate site-specific mitigation measures associated with the determined level of risk can be found in 'Section 8.2' of the 'IAQM Guidance on the Assessment of Dust from Demolition and Construction'. The appropriate site-specific construction dust mitigation for the West Burton sites are listed below, and are divided into general measures applicable to all sites and measures applicable specifically to demolition, earthworks, construction and trackout. They are categorised into 'highly recommended' and 'desirable' measures in accordance with the IAQM Guidance.

[IAQM Guidance on the Assessment of Dust from Demolition and Construction 'Highly Recommended' Mitigation Measures](#)

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.

- 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.
- Display the head or regional office contact information.
- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real time PM₁₀ continuous monitoring and/or visual inspections.

Site Management

- 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. A dust complaint form is presented in Appendix B.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.

Monitoring

- Carry out regular site inspections (visual dust monitoring) to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. A daily visual dust monitoring report sheet is presented in Appendix C.
- 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.

Preparing and maintaining the site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- 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 as described below.

- Cover, seed or fence stockpiles to prevent wind whipping.

Operating vehicle/machinery and sustainable travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.

Operations

- 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.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use covered skips.
- Minimise drop heights from loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- 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.

Waste management

- Avoid bonfires and burning of waste materials.

[Measures applicable to specific activities](#)

Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Trackout

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- 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.
- The mitigation measures have been divided into general measures applicable to all sites and measures applicable specifically to demolition, earthworks, construction and trackout. They are categorised into 'highly recommended' and 'desirable' measures.

[IAQM Guidance on the Assessment of Dust from Demolition and Construction 'Desirable' Mitigation Measures](#)

Communications

- No Action Required.

Monitoring

- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.

Operating vehicle/machinery and sustainable travel

- Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

[Measures applicable to specific activities](#)

Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.

- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.

Construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

17.8.3 With regard to the mitigation measures for the decommissioning phase operations, it is anticipated that the dust and particulate matter emission impacts during the decommissioning phase will be less than the impacts during construction. Therefore, following the implementation of the appropriate site-specific mitigation measures identified for the construction phase, the significance of the effects from dust and PM₁₀ emissions associated with the decommissioning works is considered to be negligible on all receptors.

Fire Management

17.8.4 The Outline Battery Storage Safety Management Plan details the mitigation measures and actions to be taken in case of a fire occurring, in addition to the safety requirements to be implemented on site.

17.8.5 As a fire could occur at any location within the development during the site construction, operational and decommissioning phases, generic receptor locations have been used in the assessment. In case of a fire, a site manager/fire safety representative will need to assess the fire locations, wind directions and surrounding receptors. The site manager/fire safety representative will take appropriate actions accordingly. The actions to be taken include (1) to inform any potential affected residents within the zones and to advise public about health effects of smoke, related symptoms, and ways to reduce exposure; (2) to cancel outdoor events and/or (3) to have populations go to cleaner air area.

17.9 Cumulative Effects/In-Combination Effects

17.9.1 The scheme does not include any fixed plant which may give rise to industrial emissions, such as Combined Heat and Power (CHP) or boilers, therefore cumulative effects from industrial emission impacts will be not assessed.

17.9.2 Following the implementation of the site-appropriate mitigation measures detailed in Section 17.8, there will be no effects from the Scheme that could combine with effects from other sites and other developments to lead to cumulative effects during the construction phase.

- 17.9.3 With regard to traffic air quality impact from the scheme, the Scoping Opinion concluded that *“Subject to confirmation that the proposed construction vehicle numbers alone or cumulatively with other proposals on relevant links (e.g. for Cottam Solar Project) will not exceed the relevant IAQM EPUK thresholds e.g. 100 HGV Annual Average Daily Traffic (AADT), the Inspectorate considers that the need for detailed construction air quality modelling and assessment can be scoped out. Based on the nature of the development and subject to confirmation of the type and number of maintenance vehicles, the Inspectorate considers that operational traffic movements will be limited and that operational traffic air quality modelling may be scoped out.”*
- 17.9.4 However, the cumulative traffic air quality effects have been re-assessed by considering other NSIP projects in this locality for similar developments along with planning applications for the same in the ES. It is noted that there are a number of other NSIPs in this locality that are at a similar stage to this application; these have not yet been granted consent but have been considered within the heading of cumulative impacts. Details of the closest cumulative developments are provided in **Appendix 2.3 [EN010132/APP/WB6.3.2.3]** and **Figure 2.1 [EN010132/APP/WB6.4.2.1]** of the ES. The anticipated worst-case (combined West Burton 1, 2, 3 and BESS Peak Day) vehicle movements associated with the Scheme during the construction phase are forecast to be 46 HGV movements, and 326 car and LGV movements, as detailed within **ES Chapter 14: Transport and Access [EN010132/APP/WB6.2.14]**. As such, it is anticipated that the cumulative vehicle numbers would not exceed the ‘Indicative criteria for requiring an air quality assessment’ detailed within IAQM Guidance on ‘Land-use planning & development control: Planning for air quality’, January 2017 and, therefore, air quality modelling for cumulative traffic assessment will be not required.

17.10 Residual Effects

- 17.10.1 Following the implementation of the appropriate site-specific mitigation measures identified during construction, operational and decommissioning phases and during an occurrence of fire incident, the residual effects on both human receptors and ecological receptors are determined to be negligible.

17.11 References

- Ref.1 The Air Quality Standards Regulation (2016). Available at: www.legislation.gov.uk/ukxi/2016/1184
- Ref.2 The Air Quality Standards Regulation (2010) www.legislation.gov.uk/ukxi/2010/1001
- Ref.3 Defra (2019) The Air Quality Strategy.
- Ref.4 UK Legislation (1990). Environment Protection Act.
- Ref.5 Department of Energy & Climate Change (2011), Overarching National Policy Statement for Energy (EN-1).
- Ref.6 Department of Energy & Climate Change (2011), National Policy Statement for Renewable Energy Infrastructure (EN-3).
- Ref.7 Department of Energy & Climate Change (2011), National Policy Statement for Electricity Networks Infrastructure (EN-5).
- Ref.8 CLG (2019) National Planning Policy Framework.
- Ref.9 CLG (2019) Planning Practice Guide
- Ref.10 Defra (2019). Clean Air Strategy.
- Ref.11 Institute of Air Quality Management (2014). Guidance on the assessment of dust from demolition and construction.
- Ref.12 Institute of Air Quality Management, (2017). Land-Use Planning & Development Control: Planning for Air Quality v1.2.
- Ref.13 Her Majesty's Stationery Office (HMSO) (2011) The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended by The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2018). Available at: www.legislation.gov.uk/ukxi/2017/572 and www.legislation.gov.uk/ukxi/2018/695.
- Ref.14 Official Journal of the European Communities (1985) Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment. Available at: [REDACTED]
- Ref.15 OJEU (2012) Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC. Available at: [REDACTED]
- Ref.16 Manitoba Health (2012). Smoke Exposure from Wildland Fires, Interim Guidelines for Protecting Community Health and Wellbeing.
- Ref.17 Highways Agency et al. (2019) Design Manual for Roads and Bridges LA 105 Air Quality.

Ref.18 Central Lincolnshire Joint Strategic Planning Committee (CLJSPC), (2022). Central Lincolnshire Local Plan Proposed Submission Draft.