Cottam Solar Project

PEIR – Volume 2
Appendices to Chapter 17: Air Quality

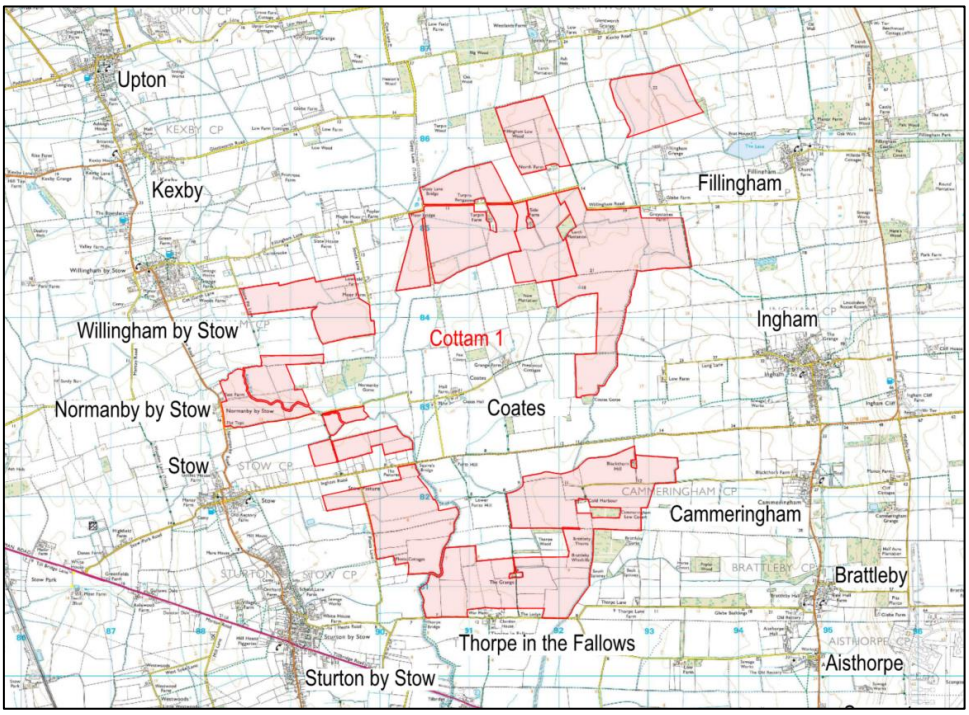
Prepared by Tetra Tech Limited
June 2022

Cottam
SOLAR PROJECT

Contents

17.1 Cottam 1 Qualitative Dust Assessment and Construction Dust Management Plan

IGP Solar Farms
Cottam 1



Qualitative Dust Assessment and Construction Dust Management Plan (CDMP)

9th May 2022

PRESENTED TO

Island Green Power Limited
Blofield Business Centre
Woodbastwick Road
Norwich
NR13 4RR

Prepared by:
Dr Zhiyuan Yang 9th May 2022
Principal Environmental Consultant

Reviewed by:
Matthew Smith 9th May 2022
Principal Environmental Consultant

Authorised by:
Nigel Mann 9th May 2022
Director

PRESENTED BY

NALO, Tetra Tech
Executive Park, Avalon Way, Anstey, Leicester, LE7 7GR
P +44 (0)116 234 8000
tetratecheurope.com

DOCUMENT CONTROL

Document:	Construction Dust Assessment and DMP
Project:	Cottam 1
Client:	Island Green Power Limited
Job Number:	784-B031438
File Origin:	lds-dc-vm-101\Data\Projects\784-B031437 & 8 West Burton & Cottam Solar Farms

REVISION HISTORY

Issue	Date	Status
1	9th May 2022	First Issue
2		
3		

EXECUTIVE SUMMARY

Tetra Tech Limited have prepared a qualitative construction dust assessment and a construction dust management plan (CDMP) in support of a planning application for Cottam 1, one of the three land parcels (the 'Site" or 'Sites) described as Cottam 1, 2 and 3 for a proposed solar project (the 'Scheme').

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'.

During construction, it is anticipated that dust sensitive receptors will potentially experience increased levels of dust and particulate matter which will result in 'low' to 'medium' risk of impacts without implementation of any mitigation and control measures. The ecological receptors will potentially experience limited increasing levels of dust which will result in a 'medium' risk of impacts without implementation of any mitigation and control measures. However, these are predicted to be short-term and temporary impacts. Throughout this period, the potential impacts from construction on air quality will be managed through site-specific mitigation measures. With these mitigation measures in place, the effects from the construction of the Cottam 1 Site are not predicted to be significant.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
CEMP	Construction Environment Management Plan
CDMP	Construction Dust Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
DEFRA	Department for Environment Food & Rural Affairs
EPUK	Environmental Protection UK
ha	Hectare
HGV	Heavy Goods Vehicle
IAQM	The Institute of Air Quality Management
SAC	Special Areas of Conservation
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
TG	Technical Guidance
TGN	Technical Guidance Note

1.0 INTRODUCTION

Tetra Tech Limited have prepared a qualitative dust assessment and a construction dust management plan (CDMP) in support of a planning application for Cottam 1, one of the three land parcels (the 'Site" or 'Sites) described as Cottam 1, 2 and 3, for a proposed solar project (the 'Scheme').

The qualitative construction dust assessment and the CDMP are required in accordance with the Planning Inspectorate's Scoping Opinion '*Proposed Cottam Solar Project, Case Reference: EN010133, dated on 09 March 2022*'. The Scoping Opinion – ID 3.18.1 states the following:

> *"…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."*

The aims of a Construction Environmental Management Plan (CEMP) are to outline how a construction project will avoid, minimise or mitigate effects on the environment and surrounding area. The CEMP is designed to cover a number of individual project areas for the entire Scheme, for example, air quality, water quality and drainage, noise and vibration. The purpose of the CDMP is to identify appropriate site-specific mitigation measures in control dust emissions during the Site construction and the CDMP will be produced as a part of the Scheme CEMP.

1.1 SITE LOCATION AND CONTEXT

The Scheme comprise a number of land parcels (the 'Site' or 'Sites') described as Cottam 1, 2 and 3 for the solar arrays, grid connection infrastructure and energy storage; and the cable route corridors. The Sites are located approximately 6.5 km south-east and 4 km north-east of Gainsborough.

Cottam 1 Site is made up of a number of sites/fields clustered within an area of countryside centred around the village of Coates in the district of West Lindsey.

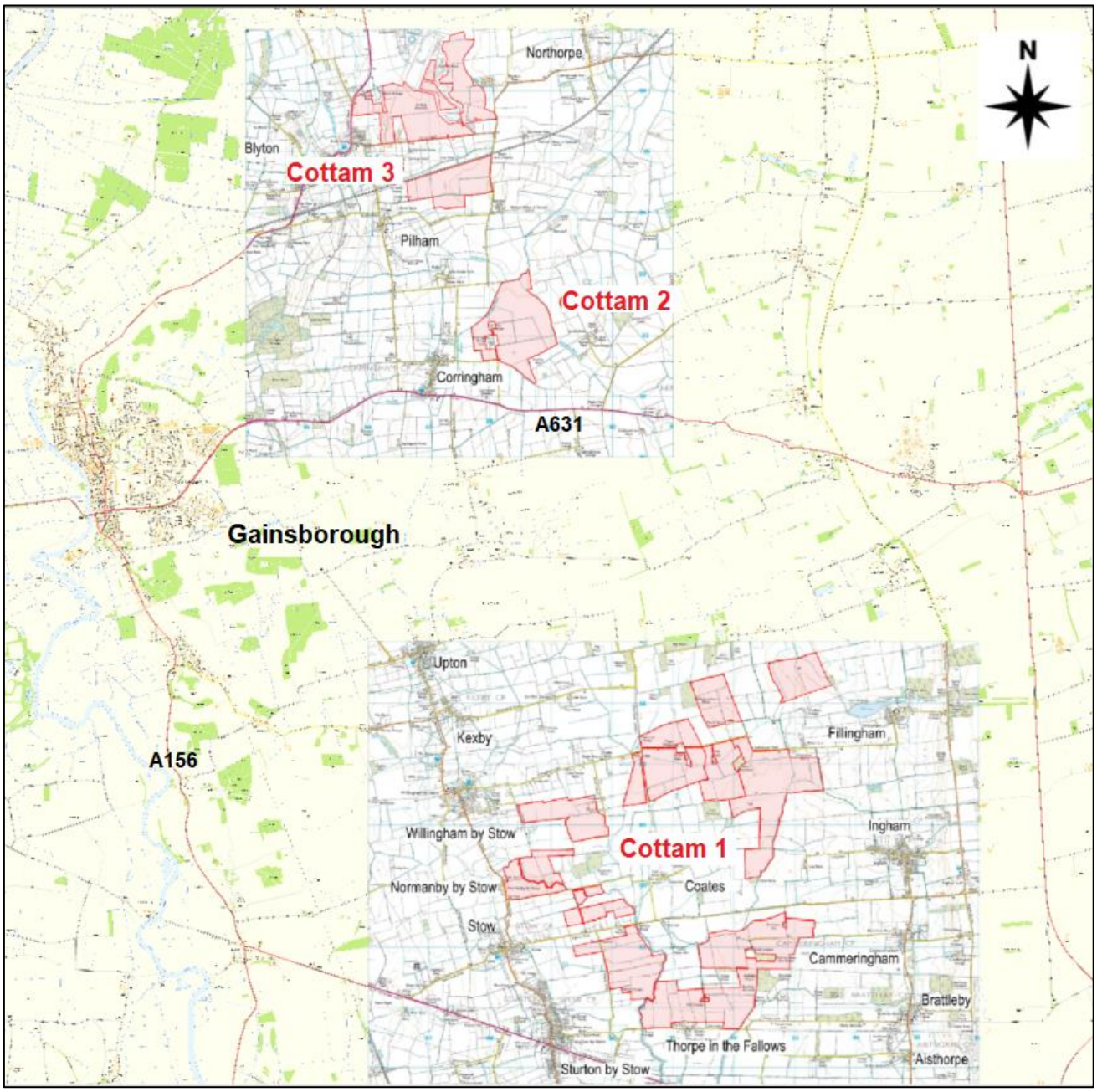
Cottam 2 Site is located to the north of Cottam 1 and is located to the east of the village of Corringham.

Cottam 3 Site is located to the north of Cottam 2 and to the north-east and south-east of the village of Blyton.

The majority of the Scheme will be located within the administrative boundary of West Lindsey District Council and Lincolnshire County council.

The locations of all three Sites for the overall scheme are shown in **Figure 1-1** below.

Figure 1-1 Overall Scheme Plan

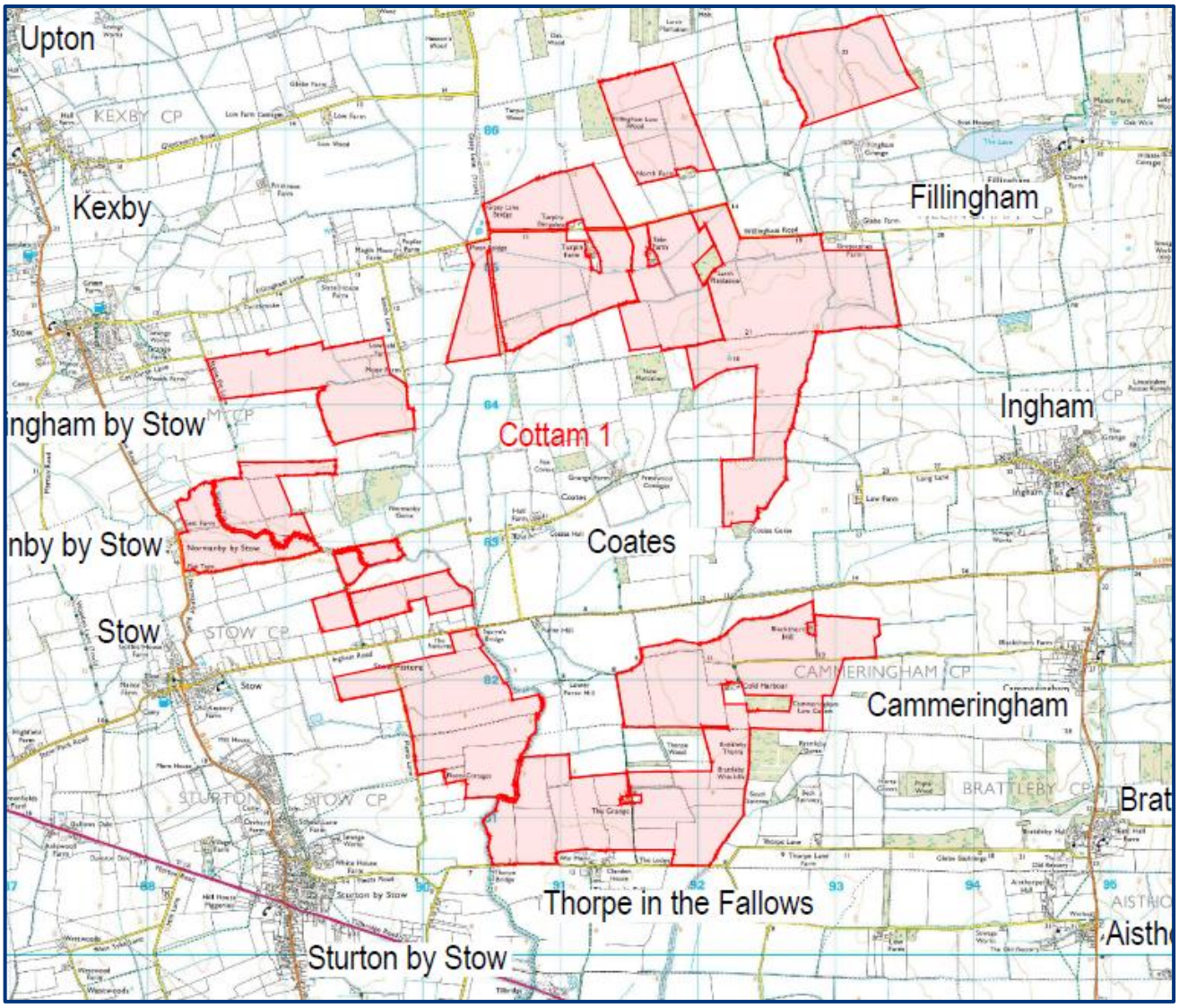


The Cottam 1 Site is approximately 894 ha in area. The entirety of the Cottam 1 is in agricultural use. Isolated parts of the landholding appear to be used for storing materials associated with farming.

The topography at Cottam 1 is relatively flat and the development Sites are predominantly well screened from their immediate surroundings by tall hedges around the boundaries of the Sites.

The central Grid Reference Cottam 1 Site is approximately 492250, 383350. Reference should be made to **Figure 1-2** below, for a map of the application site and surrounding area.

Figure 1-2 Site and Surrounding Area



The following assessment stages have been undertaken as part of this assessment:

- Policy and legislative context;
- Background;
- Construction dust risk assessment; and
- Site-specific construction dust mitigation.

In the following sections of this report, the assessment considers the potential effects of dust and particulate emissions from Site activities and materials movement during the Site construction phase, based on the construction qualitative risk assessment method detailed in the Institute of Air Quality Management's (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction' document, published in 2014.

2.0 POLICY AND LEGISLATIVE CONTEXT

2.1 DOCUMENTS CONSULTED

The following documents and relevant Legislation and Best Practice Guidance were consulted when undertaking this assessment:

- National Planning Policy Framework, Ministry for Housing, Communities and Local Government, Revised July 2021;
- Planning Practice Guidance: Air Quality, Ministry for Housing, Communities and Local Government, November 2019;
- The Air Quality Standards Regulations (Amendments), 2016;
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Defra, 2007;
- The Environment Act, 1995;
- The Environment Act, 2021;
- Local Air Quality Management Technical Guidance LAQM.TG16, Defra, 2021;
- Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, LA 105 Air quality, Highways England, November 2019;
- Land-Use Planning & Development Control: Planning for Air Quality, EPUK & IAQM, 2017;
- Guidance on the Assessment of Dust from Demolition and Construction, IAQM, 2014;
- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1), IAQM, May 2020; and,
- Ecological Assessment of Air Quality Impacts, CIEEM, January 2021.

Websites Consulted

- Google maps (maps.google.co.uk);
- The UK National Air Quality Archive (www.airquality.co.uk);
- Department for Transport Matrix (www.dft.go.uk/matrix);
- emapsite.com;
- Multi-Agency Geographic Information for the Countryside (http://magic.defra.gov.uk/);
- Planning Practice Guidance (http://planningguidance.planningportal.gov.uk/);
- West Lindsey District Council (https://www.west-lindsey.gov.uk/); and
- Lincolnshire County Council (https://www.lincolnshire.gov.uk/).

3.0 BACKGROUND

Emissions of dust to air can occur during the preparation of the land (e.g. demolition, land clearing, and earth moving), and during construction. Emissions can vary substantially from day to day, depending on the level of activity, the specific operations being undertaken, and the weather conditions. A large proportion of the emissions result from site plant and road vehicles moving over temporary roads and open ground. If mud is allowed to get onto local roads, dust emissions can occur at some distance from the originating site. The scale of these impacts depends on the dust suppression and other mitigation measures applied (Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management (IAQM), Version 1.1, 1st June 2016).

In terms of effects, construction sites can also give rise to annoyance due to the soiling of surfaces by dust. Very high levels of soiling can also damage plants and affect the diversity of ecosystems. Additionally, there is evidence of major construction sites increasing long term particulate matter (PM_{10}) concentrations and the number of days when PM_{10} concentrations exceed 50µg/m^3, the daily limit value for this pollutant. Exposure to PM_{10} has long been associated with a range of health effects.

The impacts depend on the mitigation measures adopted. This assessment is to identify the risk of dust impacts from a site and to identify appropriate mitigation measures reduce or eliminate the risks.

In this assessment the term ‘impact’ has been used to describe a change in concentration or dust deposition and ‘effect’ to describe the consequences of any impacts.

3.1 POTENTIAL DUST IMPACTS

The main air quality impacts that may arise during demolition and construction activities are:

1. Dust deposition, resulting in the soiling of surfaces;
2. Visible dust plumes, which are evidence of dust emissions;
3. Elevated PM_{10} concentrations, as a result of dust generating activities on site; and
4. An increase in concentrations of airborne particles due to exhaust emissions from diesel powered vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

The most common impacts are dust soiling and increased ambient PM_{10} concentrations due to dust arising from activities on the construction site. Dust soiling will arise from the deposition of dust in all size fractions. The ambient dust relevant to health outcomes will be that measured as PM_{10}, although most of this will be in the coarse ($PM_{2.5-10}$) fraction, rather than the $PM_{2.5}$ fraction.

3.2 DUST

Particles greater than 10µm are likely to settle out relatively quickly and may cause annoyance due to their soiling capability. Although there are no formal standards or criteria for nuisance caused by deposited particles, the IAQM ‘Guidance on Monitoring in the Vicinity of Demolition and Construction Sites’ (October 2018) and the Environment Agency Technical Guidance Note (TGN) M17 states that dust is usually compared with a

'complaints likely' guideline of 200mg/m^2/day. Therefore, a deposition rate of 200mg/m^2/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.

Construction activities have the potential to suspend dust, which could result in annoyance of residents surrounding the site. Measures will be taken to minimise the emissions of dust as part of good site practice.

3.3 PARTICULATE MATTER (PM_{10} AND $PM_{2.5}$)

PM_{10} and $PM_{2.5}$ are abbreviations for particulate matter suspended in the air.

- PM_{10}: inhalable particles, with diameters that are generally 10 micrometres and smaller; and
- $PM_{2.5}$: fine inhalable particles, with diameters that are generally 2.5 micrometres and smaller.

The UK Air Quality Standards seek to control the health implications of respirable PM_{10} or $PM_{2.5}$. However, the majority of particles released from construction will be greater than this in size.

Construction works on site have the potential to elevate localised PM_{10} or $PM_{2.5}$ concentrations in the area. On this basis, mitigation measures should still be taken to minimise these emissions as part of good site practice.

3.4 RISK OF DUST EMISSIONS

The risk of dust emissions from a demolition/construction site causing loss of amenity and/or health or ecological impacts is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc.);
- The duration of these activity;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activities;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of the receptors to dust.

The quantity of dust emitted from construction operations will be related to the area of land being worked, and the level of construction activity (nature, magnitude and duration). Emissions from construction vehicles passing over unpaved ground can be particularly important.

The wind direction, wind speed and rainfall, at the time when a construction activity is taking place, will also influence whether there is likely to be a dust impact. Adverse impacts can occur in any direction from a site. They are, however, more likely to occur downwind of the prevailing wind direction and/or close to the site.

Dust impacts are more likely to occur during drier periods, as rainfall acts as a natural dust suppressant.

Local conditions will also influence the dust impacts. Topography and natural barriers (e.g. woodland) will reduce airborne concentrations due to impaction.

3.5 POTENTIAL EFFECTS OF DUST EMISSIONS

The main potential effects of dust and particulate matter 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 effects due to inhalation e.g. asthma or irritation of the eyes.

Construction activities can give rise to short-term elevated dust/PM_{10} concentrations in neighbouring areas. This may arise from vehicle movements, soiling of the public highway, demolition or windblown stockpiles.

3.6 RECEPTORS

3.6.1 Human Receptors

A ‘human receptor’, refers to any location where a person or property may experience the adverse effects of airborne dust or dust soiling or exposure to PM_{10} over a time period relevant to the air quality objectives, as defined in the Government’s technical guidance for Local Air Quality Management (LAQM, technical Guidance (TG16) April 2021). In terms of annoyance effects, this will most commonly relate to dwellings, but may also refer to other premises such as buildings housing cultural heritage collections (e.g. museums and galleries), vehicle showrooms, food manufacturers, electronics manufacturers, amenity areas and horticultural operations (e.g. salad or soft-fruit production).

The selection criteria of human receptors are as:

A ‘human receptor’ within:

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

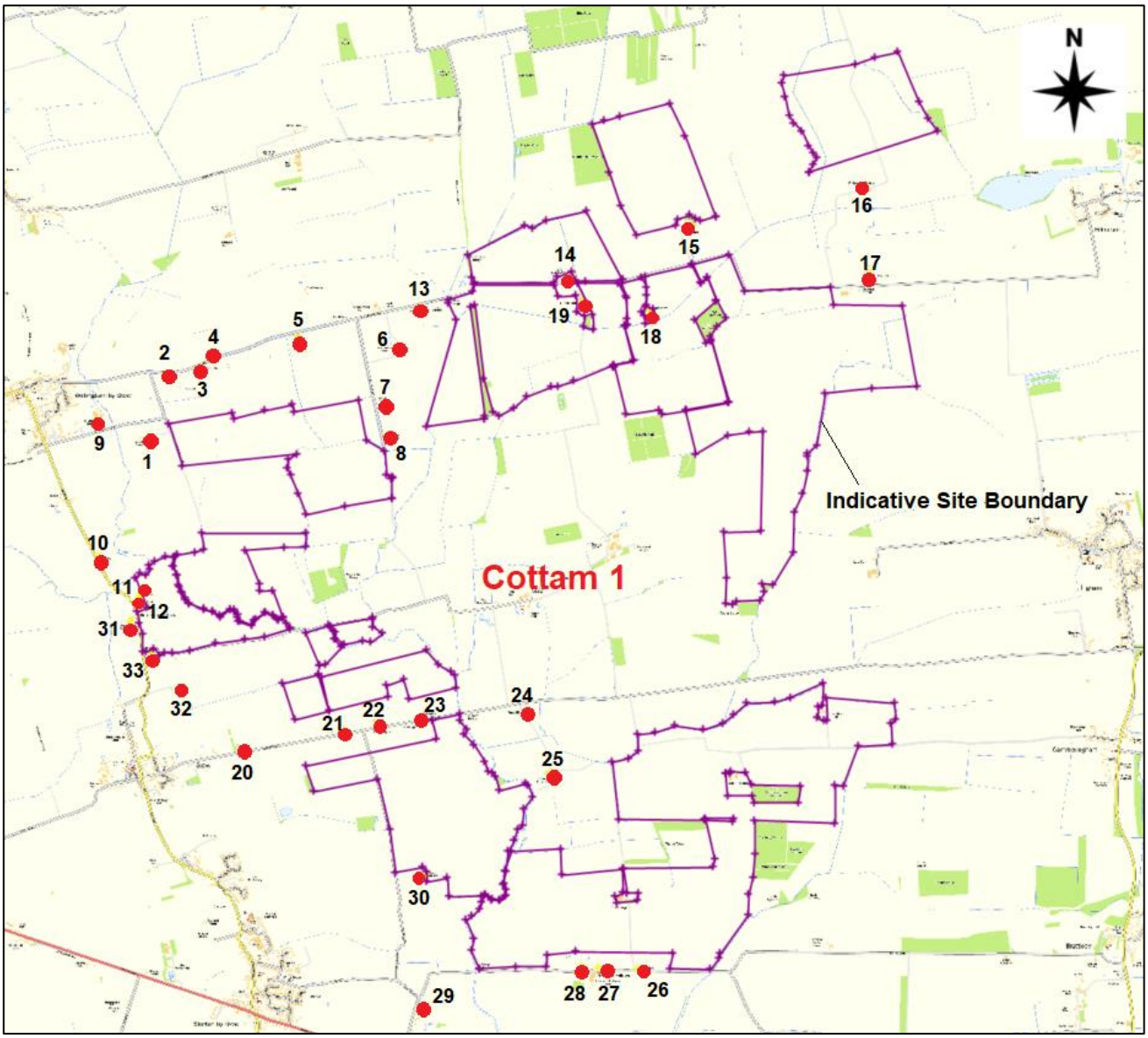
Receptors selected within the assessment have been located at the closest surrounding sensitive buildings. A summary of the identified sensitive receptors is presented within **Table 3-1** and **Figure 3-1** below.

Table 3-1 Sensitive Receptors

Site ID	Description	Receptor Type	Location	Approximate Distance from Red-line Boundary (m)
1	Woods Farm	Residential	West of the Site	140
2	The Cottage	Residential	North of the Site	320
3	Carisbrooke	Residential	North of the Site	320
4	Uppermill Farm	Residential	North of the Site	380
5	Slate House Farm	Residential	North of the Site	460
6	Chestnut Manor	Residential	North of the Site	340
7	Lowfield Farm	Residential	Surrounded by the Site Boundary	140
8	Moor Farm	Residential	Surrounded by the Site Boundary	70

9	Grange Farm	Residential	West of the Site	460
10	Tilby-Dale	Residential	West of the Site	260
11	East Farm Cottage	Residential	Adjacent to the site boundary	15
12	East Farm	Residential	Adjacent to the site boundary	100
13	The Hollies	Residential	West of the Site	200
14	Turpins Bungalows	Residential	Surrounded by the Site Boundary	30
15	North Farm	Residential	Surrounded by the Site Boundary	80
16	Fillingham Grange	Residential	Surrounded by the Site Boundary	230
17	Glebe Farm	Residential	Surrounded by the Site Boundary	90
18	Side Farm S	Residential	Adjacent to the site boundary/ Surrounded by the Site Boundary	15
19	Turpin Farm	Residential	Adjacent to the site boundary/ Surrounded by the Site Boundary	15
20	17 Ingham Road	Residential	West of the Site	370
21	25 Ingham Road	Residential	Adjacent to the site boundary/ Surrounded by the Site Boundary	150
22	31 Ingham Road	Residential	Adjacent to the site boundary/ Surrounded by the Site Boundary	170
23	The Pastures	Residential	Adjacent to the site boundary/ Surrounded by the Site Boundary	75
24	Furze Hill	Residential	East of the Site	450
25	Lower Furze Hill	Residential	Surrounded by the Site Boundary	140
26	The Lodge	Residential	South of the Site	90
27	Clandon House	Residential	South of the Site	80
28	1 Thorpe Lane	Residential	South of the Site	90
29	The White Cottage	Residential	South of the Site	470
30	Fleets Cottages	Residential	Adjacent to the site boundary	10
31	West Farm	Residential	Adjacent to the site boundary	10
32	Church Farm View	Residential	West of the Site	240
33	4 Flat Tops	Residential	Adjacent to the site boundary	10

Figure 3-1 Sensitive Receptor Location Plan



3.6.2 Ecological Receptors

An 'ecological receptor' refers to any sensitive habitat affected by dust soiling (A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1), IAQM, May 2020). This includes the direct impacts on vegetation (A Farmer, 1993, The Effects of Dust on Vegetation - A Review, Environmental Pollution 79, 63-75) or aquatic ecosystems of dust deposition, and the indirect impacts on fauna (e.g. on foraging habitats). For locations with a statutory designation, e.g. Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs), consideration will be given as to whether the site is sensitive to dust, and this will depend on why it has been designated. Some non-statutory sites (i.e. local wildlife sites) and/or locations with very specific sensitivities may also be considered if appropriate.

Dust from demolition and construction sites deposited on vegetation may create ecological stress within the local plant community. During long dry periods dust can coat plant foliage adversely affecting photosynthesis

and other biological functions. Rainfall removes the deposited dust from foliage and can rapidly leach chemicals into the soil.

The selection criteria of ecological receptors in IAQM guidance are as:

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

In addition, other relevant guidelines have been used in identify ecological receptors within the vicinity of the site:

- The Conservation of Habitats and Species Regulations (2019) require competent authorities to review planning applications and consents that have the potential to impact on European designated sites (e.g. Special Protection Areas); and
- The IAQM 'A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites' (2020) was utilised within the assessment.

Following designated site(s) (ecological sites) were identified:

- Willingham to Fillingham Road Verges Local Wildlife Site (LWS), located within or adjacent to the Site.

  Theses road verges are wide and contain indicators of unimproved/semi-improved calcareous and neutral grassland. Both verges run alongside ditches with a species-rich hedgerow;

- Willingham Parish Fields LWS located approximately 165m north-west of the Site;

  These are two adjacent fields beside Stone Pit Lane that together support a good range of neutral grassland plants, as well as a botanically-rich pond, some woody vegetation and an interesting fauna.

- Upton Grange Road Verges LWS, located approximately 1.1 km north of the site.

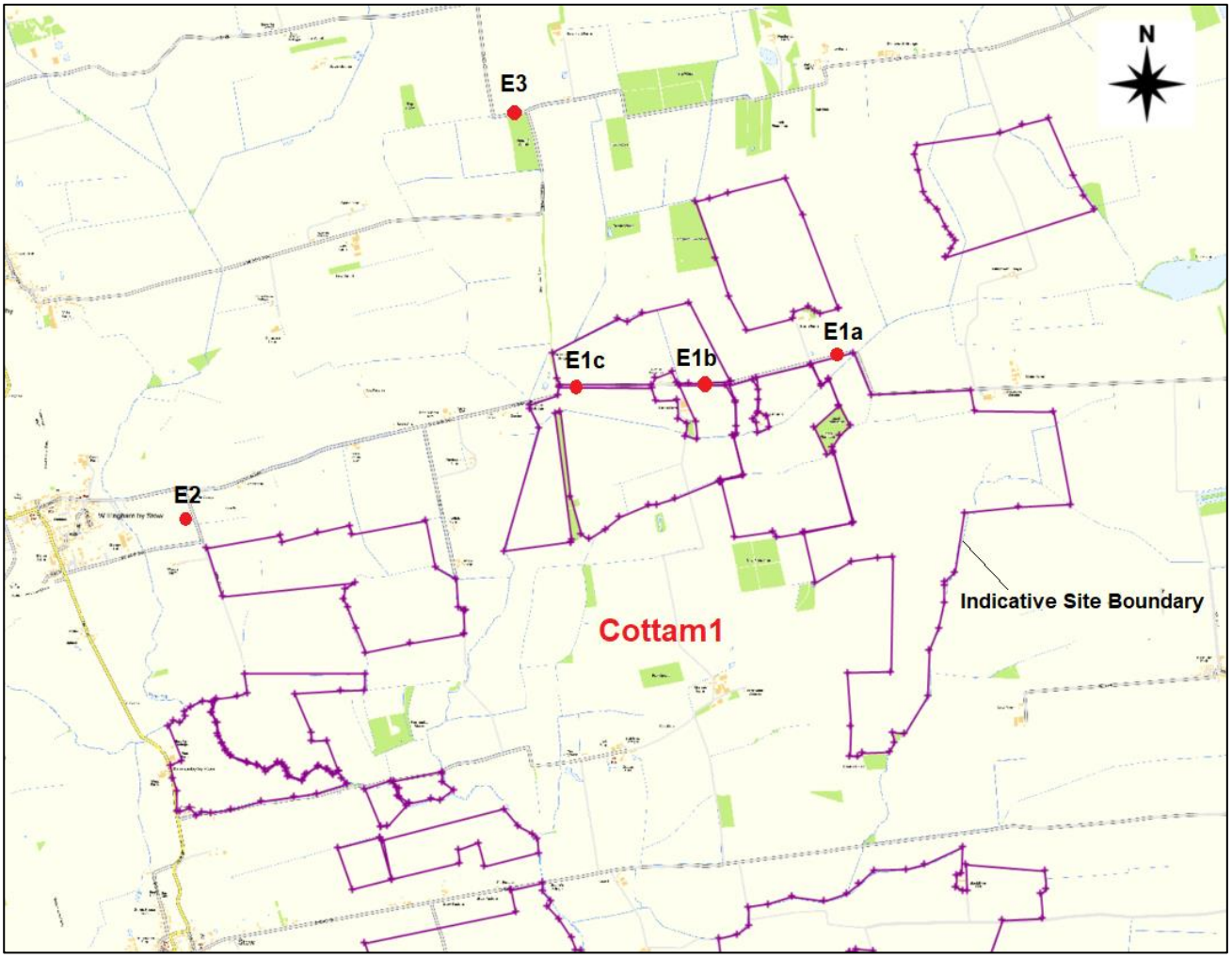
  The north and east verges are exceptionally species-rich with a particular abundance of both meadow barley and zigzag clover. The south and west verges comprise linear herb-rich neutral grassland with adjacent species-poor hedgerows.

The ecological receptors that were selected within the assessment are presented within **Table 3-2** and **Figure 3-2**.

Table 3-2. Ecological Sensitive Receptor Location

Site ID	Site	Designation	UK NGR (m)		Distance from Site (m)
			X	Y	
E1a, E1b and E1c	Willingham to Fillingham Road Verges Local Wildlife Site (LWS),	LWS	491300	385280	Within or adjacent to the Site
E2	Willingham Parish Fields LWS	LWS	488320	384480	160
E3	Upton Grange Road Verges LWS	LWS	490200	386840	1,100

Figure 3-2. Ecological Receptor Location Plan



3.7 SOURCES, RELEASES, AND IMPACTS

The typical solar farm construction stages may include:

1. Site preparation;
2. Solar array installation;
3. Electrical infrastructure installation;
4. Testing and commissioning; and
5. Completion works.

Dust may be released from each construction stages. Potential hight level dust release may occur at site preparation and completion work stages.

Dust Release Activities

The dust release activities during the site preparation may include:

- Field survey and setting out;
- Laying access roads/ temporary tracks;

- Preparation of earthing system;
- Preparation of foundations/ hard standing for construction compound/ inverter housing/ substation;
- Installation of perimeter fence;
- Construction of foundations/preparation for sub stations and transformer stations;
- Trenching for cables and ditches; and

The dust release activities during the completion works may include:

- Removal of site compound and welfare facilities;
- Landscape planting (grass seeding if required, and hedgerow, existing hedgerow gapping-up, and tree planting); and
- Provision of surface water management system (lined swales/ ditches).

Major Dust Release Sources

Potential high level dust releasing sources are:

a) Laying access roads/temporary tracks, vehicle movements on dry surface of the unpaved roads;
b) Earthworks, soil stripping, and preparation of foundations/ hard standing for construction compound/ inverter housing/ substation, including the operations of machinery, for example, excavators, loader, trucks.
c) Temporary stockpile of soil;
d) Vehicle movements on the earthwork surface.

Once released into the atmosphere, dust can be transported through the air to nearby receptors. Sensitive receptors include humans living within proximity of the proposed site.

3.8 METHODOLOGY

The construction phase assessment utilises the IAQM Guidance on the Assessment of Dust from Demolition and Construction document published in February 2014.

Four construction processes are considered; these are demolition, earthworks, construction and trackout. For each of these phases, the impact description of the potential dust impacts is derived following the determination of a dust emission magnitude and the distance of activities to the nearest sensitive receptor, therefore assessing worst case impacts.

The details of construction phase assessment methodology are presented in Appendix A.

4.0 CONSTRUCTION DUST RISK ASSESSMENT

4.1 WORKS PROGRAMME

The dust risk assessment is considered to represent a worst-case scenario, assuming the potential maximum dust impacts on surrounding receptor locations in accordance with 'Guidance on the Assessment of Dust from Demolition and Construction', IAQM, 2014.

4.2 ASSESSMENT RESULTS

Based on the methodology of '*Step 2A'* in the IAQM guidance, the scale of the anticipated works has determined 'the potential dust emission magnitude' for each process, as presented in **Table 4-1** below.

Table 4-1 Potential Dust Emission Magnitude

Construction Process	Site Criteria	Dust Emission Magnitude
Demolition	No demolition required	N/A
Earthworks	Total Site Area: >10,000 m^2	Large
Construction	Total Building Volume >100,000 m^3	Large
Trackout	Assumed 10 - 50 HDV outward movements in any one day; unpaved road length >100m	Large

The sensitivity of the surrounding area to each construction process has been determined following *'Step 2B'* of the IAQM guidance. The assessment has determined the area sensitivities as shown in **Table 4-2** below.

The sensitivity of the ecological receptors is considered not applicable within the construction phase assessment due to the distance from the application site which is greater than 500m. This is in accordance with *Table 4* of the IAQM Guidance.

Table 4-2 Sensitivity of the Area

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	Medium	<20 m from site boundary
Construction	Medium		Low		Medium	
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	Medium	<20 m from site boundary

The dust emission magnitude determined in **Table 4-1** has been combined with the sensitivity of the area determined in **Table 4-2**, to determine the risk of impacts prior to the implementation of appropriate mitigation measures. The potential impact significance of dust emissions associated with the development without mitigation, using the matrices in Table A4 to Table A7 in Appendix A, is presented in **Table 4-3** below.

Table 4-3 Impact Description of Construction Activities without Mitigation

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	Medium
Construction	Medium	Low	Medium
Trackout	Medium	Low	Medium

Appropriate mitigation measures are detailed and presented in Section 5. Following the adoption of these measures, the subsequent impact significance of the construction phase is not predicted to be significant.

5.0 SITE-SPECIFIC CONSTRUCTION DUST MITIGATION

5.1 CONSTRUCTION PHASE

The dust risk categories have been determined in Section 4 for each of the construction activities. The assessment has determined that the potential impact description of dust emissions associated with the construction phase of the scheme range from 'low risk' to 'medium risk' at the worst affected receptors.

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 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.

The 'highly recommended' mitigation measures for the scheme are detailed in **Table 5-1**.

The 'desirable' mitigation measures for the scheme are detailed in **Table 5-2**.

Table 5-1 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 PM_{10} 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 actives 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.

Table 5-2 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.

Following the implementation of the mitigation measures detailed in the tables above, the impact description of the construction phase is not considered to be significant.

6.0 CONCLUSIONS

Tetra Tech Limited have prepared a qualitative construction dust assessment and a construction dust management plan (CDMP) in support of a planning application for Cottam 1, one of the three land parcels (the 'Site" or 'Sites) described as Cottam 1, 2 and 3 for a proposed solar project (the 'Scheme').

The qualitative construction dust assessment and the CDMP have been produced to meet the requirement within the Planning Inspectorate's Scoping Opinion '*Proposed West Burton Solar Project, Case Reference: EN010133, dated on 09 March 2022*'. The Scoping Opinion - ID 3.18.1 states the following:

> *"…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."*

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'.

During the Scheme construction, it is anticipated that dust sensitive receptors will potentially experience increased levels of dust and particulate matter which will result in 'low' to 'medium' risk of impacts without implementation of any mitigation and control measures. The ecological receptors will potentially experience limited increasing levels of dust which will result in 'medium' risk of impacts without implementation of any mitigation and control measures. However, these are predicted to be short-term and temporary impacts. Throughout this period, the potential impacts from construction on air quality will be managed through site-specific mitigation measures. With these mitigation measures in place, the effects from the construction of the Cottam 1 Site are not predicted to be significant.

APPENDIX A CONSTRUCTION PHASE ASSESSMENT METHODOLOGY

The following information sets out the adopted approach to the construction phase impact assessment in accordance with the aforementioned IAQM guidance[1].

Step 1 – Screen the Requirement for a more Detailed Assessment

An assessment is required if there are sensitive receptors within 350m of the site boundary, within 50m of the route(s) used by construction vehicles on the surrounding road network, or within 500m from the site entrance. A detailed assessment is also required if there is an ecological receptor within 50m of the site boundary.

Step 2A – Define the Potential Dust Emission Magnitude

Demolition

The dust emission magnitude for the demolition phase has been determined based on the below criteria:

- *Large*: Total building volume >50 000m^3, potentially dusty construction (e.g. concrete), on-site crushing and screening, demolition activities >20m above ground level;
- *Medium*: Total building volume 20 000m^3 – 50 000m^3, potentially dusty construction material, demolition activities 10-20m above ground level; and,
- *Small*: Total building volume <20 000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

Earthworks

The dust emission magnitude for the planned earthworks has been determined based on the below criteria:

- *Large:* Total site area >10 000m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100 000 tonnes;
- *Medium*: Total site area 2 500m^2 – 10 000m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4m-8m in height, total material moved 20 000 tonnes – 100 000 tonnes; and
- *Small:* Total site area <2 500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <10 000 tonnes, earthworks during wetter months.

Construction

The dust emission magnitude for the construction phase has been determined based on the below criteria:

- *Large:* Total building volume >100 000m^3, on site concrete batching; sandblasting
- *Medium:* Total building volume 25 000m^3 – 100 000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and,
- *Small:* Total building volume <25 000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

The dust emission magnitude for trackout has been determined based on the below criteria:

- *Large:* >50 HGV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- *Medium:* 10-50 HGV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and,
- *Small:* <10 HGV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B - Defining the Sensitivity of the Area

Sensitivities of People to Dust Soiling Effects

- *High:*
  - Users can reasonably expect an enjoyment of a high level of amenity;

[1] Institute of Air Quality Management 2014. *Guidance on the Assessment of dust from demolition and construction.*

- The appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably expect to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land; and,
- Indicative examples include dwellings, museums and other culturally important collections, medium- and long-term car parks and car showrooms.

- *Medium:*
  - Users can reasonably expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home;
  - The appearance, aesthetics or value of their property could be diminished by soiling;
  - The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land; and,
  - Indicative examples include parks and places of work.
- *Low:*
  - The enjoyment of amenity would not reasonably be expected;
  - Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling;
  - There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land; and,
  - Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A-1. Sensitivity of the Area to Dust Soiling Effects on People and Property

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

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of People to the Health Effects of PM_{10}

- *High:*
  - Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day);
  - Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.
- *Medium:*
  - Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day); and,
  - Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.
- *Low:*
  - Locations where human exposure is transient; and,
  - Indicative examples include public footpaths, playing fields, parks and shopping streets.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A-2. 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/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28 - 32 µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24 – 28 µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of Receptors to Ecological Effects

- *High:*
  - Locations with an international or national designation and the designated features may be affected by dust soiling;
  - Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain; and,
  - Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
- *Medium:*
  - Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown;
  - Locations with a national designation where the features may be affected by dust deposition; and,
  - Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
- *Low:*
  - Locations with a local designation where the features may be affected by dust deposition; and,
  - Indicative example is a local Nature Reserve with dust sensitive features.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A-3. Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Step 2C - Defining the Risk of Impacts

The risk of impacts with no mitigation is determined by combining the dust emission magnitude determined in Step 2A and the sensitivity of the area determined in Step 2B.

The following tables provide a method of assigning the level of risk for each activity.

Demolition

Table A-4. Risk of Dust Impacts, Demolition

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

Earthworks

Table A-5. Risk of Dust Impacts, Earthworks

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

Construction

Table A-6. Risk of Dust Impacts, Construction

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

Trackout

Table A-7. Risk of Dust Impacts, Trackout

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

Step 3 – Site Specific Mitigation

The dust risk categories for each of the four activities determined in Step 2C should be used to define the appropriate, site-specific mitigation measures to be adopted.

These mitigation measures are contained within section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition and Construction.

APPENDIX B DUST COMPLAINT FORM

Dust Complaint Form

Customer Details	
Customer Name -	
Address – Postcode -	
Customer Contact Details -	
Tel -	
Email -	
Date -	
Complaint Ref Number -	
Complaint Details -	

Investigation Details	
Investigation carried out by -	
Position -	
Date & time investigation carried out -	
Weather conditions -	
Wind direction and speed -	
Investigation findings -	
Feedback given to Environment Agency and/or local authority -	
Date feedback given -	
Feedback given to public -	
Date feedback given -	

Review and Improve	
Improvements needed to prevent a reoccurrence -	
Proposed date for completion of the improvements -	
Actual date for completion -	
If different insert reason for delay -	
Does the dust management plan need to be updated -	
Date that the dust management plan was updated -	

Closure	
Site manager review date	
Site manager signature to confirm no further action required	

APPENDIX C DAILY VISUAL DUST MONITORING REPORT SHEET

Daily Visual Dust Monitoring Report Sheet

Site Manager	Date	Completed by

	Location 1	Location 2	Location 3	Location 4
Start Time				
Wind Speed (m/s)				
Wind Direction				
Visible Dust Soiling (Y/N)				
Additional notes including site operations				
Actions Required?				

APPENDIX D REPORT TERMS & CONDITIONS

This Report has been prepared using reasonable skill and care for the sole benefit of Island Green Power Limited ('the Client') for the proposed uses stated in the report by Tetra Tech Limited ('Tetra Tech'). Tetra Tech exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

No liability is accepted, or warranty given for; unconfirmed data, third party documents and information supplied to Tetra Tech or for the performance, reliability, standing etc. of any products, services, organisations or companies referred to in this report. Tetra Tech does not purport to provide specialist legal, tax or accounting advice.

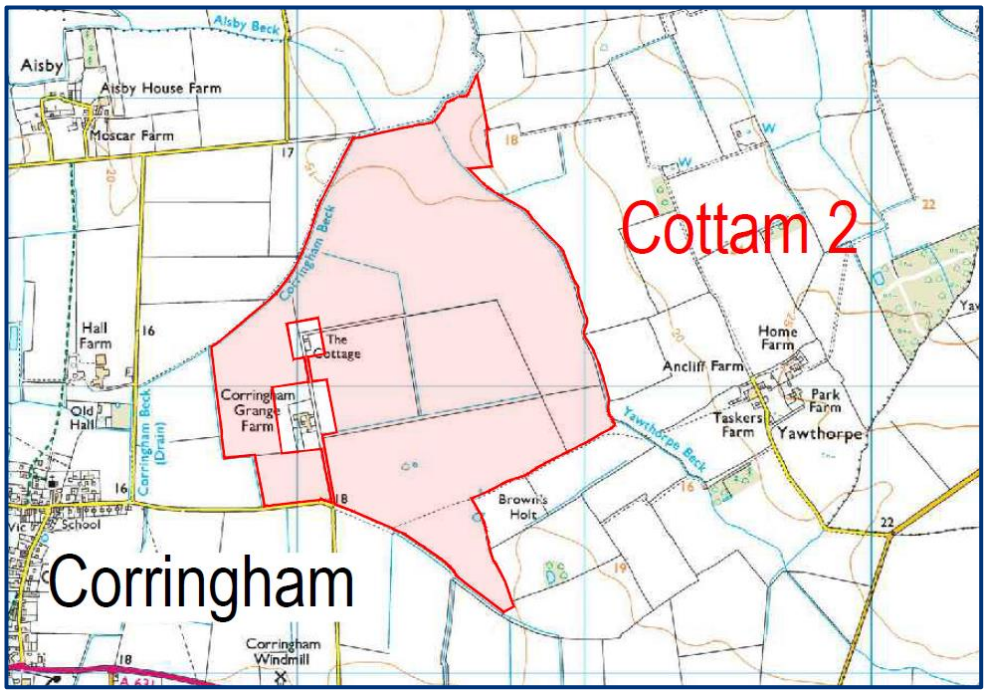
The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary, and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The 'shelf life' of the Report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.

17.2 Cottam 2 Qualitative Dust Assessment and Construction Dust Management Plan

IGP Solar Farms
Cottam 2



Qualitative Dust Assessment and Construction Dust Management Plan (CDMP)

9th May 2022

PRESENTED TO

Island Green Power Limited
Blofield Business Centre
Woodbastwick Road
Norwich
NR13 4RR

PRESENTED BY

NALO, Tetra Tech
Executive Park, Avalon Way, Anstey, Leicester, LE7 7GR

P +44 (0)116 234 8000
tetratecheurope.com

Prepared by:
Dr Zhiyuan Yang 9th May 2022
Principal Environmental Consultant

Reviewed by:
Matthew Smith 9th May 2022
Principal Environmental Consultant

Authorised by:
Nigel Mann 9th May 2022
Director

DOCUMENT CONTROL

Document:	Construction Dust Assessment and DMP
Project:	Cottam 2
Client:	Island Green Power Limited
Job Number:	784-B031438
File Origin:	lds-dc-vm-101\Data\Projects\784-B031437 & 8 West Burton & Cottam Solar Farms

REVISION HISTORY

Issue	Date	Status
1	9th May 2022	First Issue
2		
3		

EXECUTIVE SUMMARY

Tetra Tech Limited have prepared a qualitative construction dust assessment and a construction dust management plan (CDMP) in support of a planning application for Cottam 2, one of the 3 land parcels (the 'Site" or 'Sites) described as Cottam 1, 2 and 3 for a proposed solar project (the 'Scheme').

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'.

During construction, it is anticipated that dust sensitive receptors will potentially experience increased levels of dust and particulate matter which will result in 'low' risk of impacts without implementation of any mitigation and control measures. Throughout this period, the potential impacts from construction on air quality will be managed through site-specific mitigation measures. With these mitigation measures in place, the effects from the construction of the Cottam 2 Site are not predicted to be significant.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
CEMP	Construction Environment Management Plan
CDMP	Construction Dust Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
DEFRA	Department for Environment Food & Rural Affairs
EPUK	Environmental Protection UK
ha	Hectare
HGV	Heavy Goods Vehicle
IAQM	The Institute of Air Quality Management
SAC	Special Areas of Conservation
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
TG	Technical Guidance
TGN	Technical Guidance Note

1.0 INTRODUCTION

Tetra Tech Limited have prepared a qualitative dust assessment and a construction dust management plan (CDMP) in support of a planning application for Cottam 2, one of the three land parcels (the 'Site" or 'Sites) described as Cottam 1, 2 and 3, for a proposed solar project (the 'Scheme').The qualitative construction dust assessment and the CDMP are required in accordance with the Planning Inspectorate's Scoping Opinion '*Proposed Cottam Solar Project, Case Reference: EN010133, dated on 09 March 2022*'. The Scoping Opinion – ID 3.18.1 states the following:

> *"…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."*

The aims of a Construction Environmental Management Plan (CEMP) are to outline how a construction project will avoid, minimise or mitigate effects on the environment and surrounding area. The CEMP is designed to cover a number of individual project areas for the entire Scheme, for example, air quality, water quality and drainage, noise and vibration. The purpose of the CDMP is to identify appropriate site-specific mitigation measures in control dust emissions during the Site construction and the CDMP will be produced as a part of the Scheme CEMP.

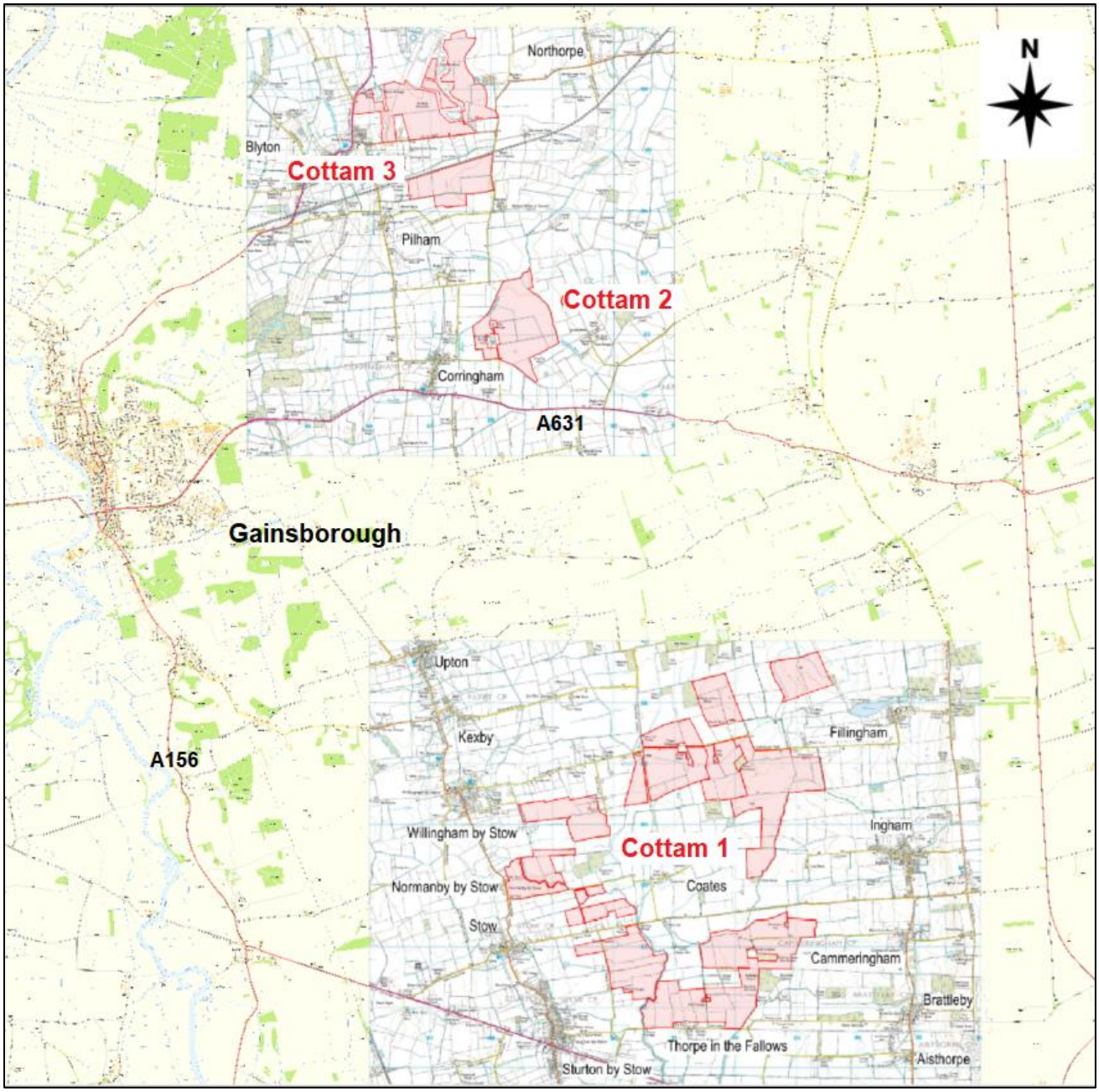
1.1 SITE LOCATION AND CONTEXT

The Scheme comprise a number of land parcels (the 'Site' or 'Sites') described as Cottam 1, 2 and 3 for the solar arrays, grid connection infrastructure and energy storage; and the cable route corridors. The Sites are located approximately 6.5 km south-east and 4 km north-east of Gainsborough.

The majority of the Scheme will be located within the administrative boundary of West Lindsey District Council and Lincolnshire County council.

The locations of all three Sites for the overall scheme are shown in **Figure 1-1** below.

Figure 1-1 Overall Scheme Plan



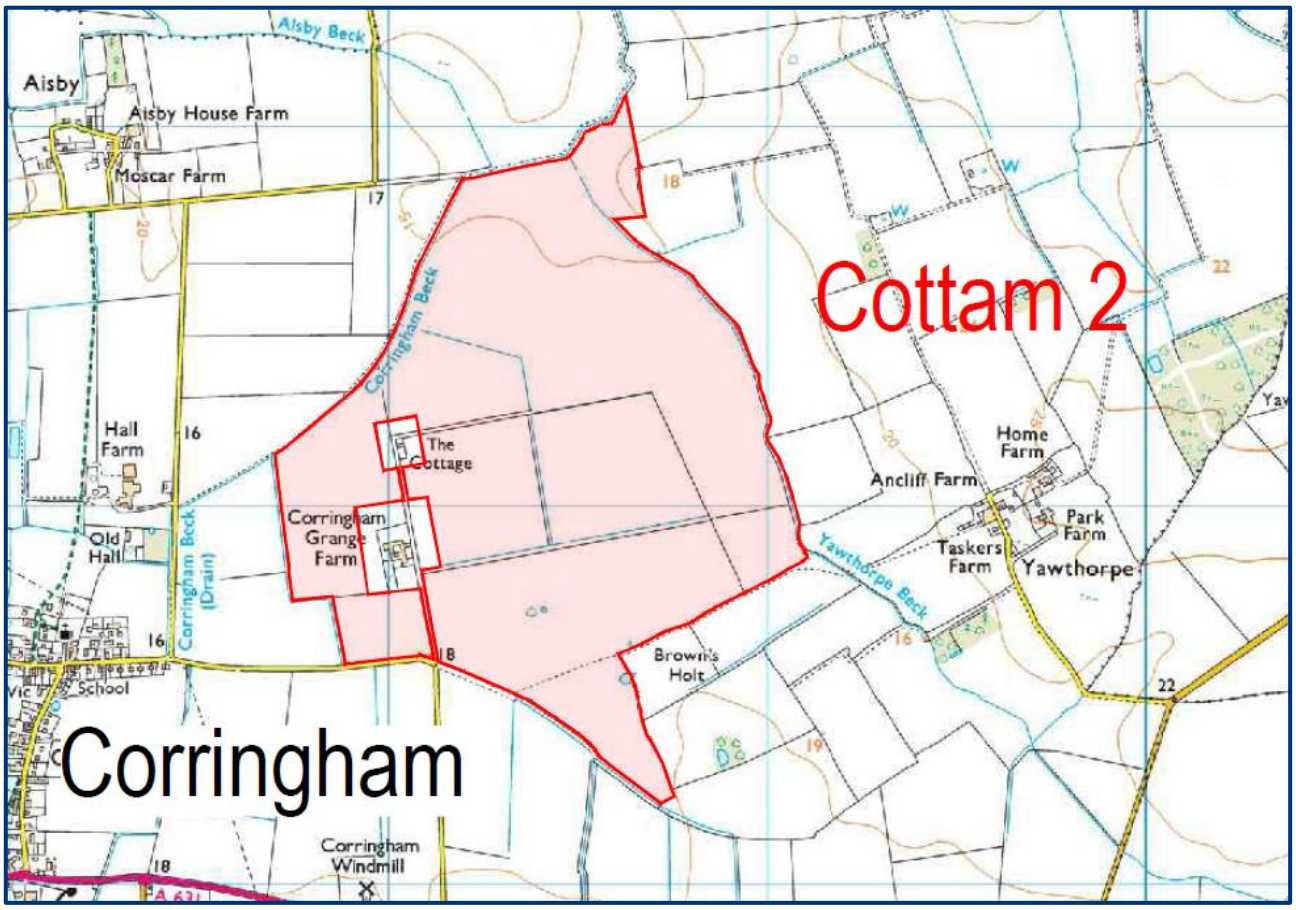
Cottam 2 sites to the north of Cottam 1 and is located to the east of the village of Corringham.

The Cottam 2 Site is approximately 132 ha in area. The entirety of the Cottam 2 is in agricultural use. Isolated parts of the landholding appear to be used for storing materials associated with farming.

The topography at Cottam 2 Site is relatively flat and the development sites are predominantly well screened from their immediate surroundings by tall hedges around the boundaries of the Sites.

The central Grid Reference Cottam 2 Site is approximately 488480, 3392050. Reference should be made to **Figure 1-2** below, for a map of the application site and surrounding area.

Figure 1-2 Site and Surrounding Area



The following assessment stages have been undertaken as part of this assessment:

- Policy and legislative context;
- Background;
- Construction dust risk assessment; and
- Site-specific construction dust mitigation.

In the following sections of this report, the assessment considers the potential effects of dust and particulate emissions from Site activities and materials movement during the Site construction phase, based on the construction qualitative risk assessment method detailed in the Institute of Air Quality Management's (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction' document, published in 2014.

2.0 POLICY AND LEGISLATIVE CONTEXT

2.1 DOCUMENTS CONSULTED

The following documents and relevant Legislation and Best Practice Guidance were consulted when undertaking this assessment:

- National Planning Policy Framework, Ministry for Housing, Communities and Local Government, Revised July 2021;
- Planning Practice Guidance: Air Quality, Ministry for Housing, Communities and Local Government, November 2019;
- The Air Quality Standards Regulations (Amendments), 2016;
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Defra, 2007;
- The Environment Act, 1995;
- The Environment Act, 2021;
- Local Air Quality Management Technical Guidance LAQM.TG16, Defra, 2021;
- Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, LA 105 Air quality, Highways England, November 2019;
- Land-Use Planning & Development Control: Planning for Air Quality, EPUK & IAQM, 2017;
- Guidance on the Assessment of Dust from Demolition and Construction, IAQM, 2014;
- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1), IAQM, May 2020; and,
- Ecological Assessment of Air Quality Impacts, CIEEM, January 2021.

Websites Consulted

- Google maps (maps.google.co.uk);
- The UK National Air Quality Archive (www.airquality.co.uk);
- Department for Transport Matrix (www.dft.go.uk/matrix);
- emapsite.com;
- Multi-Agency Geographic Information for the Countryside (http://magic.defra.gov.uk/);
- Planning Practice Guidance (http://planningguidance.planningportal.gov.uk/); and
- Lincolnshire County Council (https://www.lincolnshire.gov.uk/).

3.0 BACKGROUND

Emissions of dust to air can occur during the preparation of the land (e.g. demolition, land clearing, and earth moving), and during construction. Emissions can vary substantially from day to day, depending on the level of activity, the specific operations being undertaken, and the weather conditions. A large proportion of the emissions result from site plant and road vehicles moving over temporary roads and open ground. If mud is allowed to get onto local roads, dust emissions can occur at some distance from the originating site. The scale of these impacts depends on the dust suppression and other mitigation measures applied (Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management (IAQM), Version 1.1, 1st June 2016).

In terms of effects, construction sites can also give rise to annoyance due to the soiling of surfaces by dust. Very high levels of soiling can also damage plants and affect the diversity of ecosystems. Additionally, there is evidence of major construction sites increasing long term particulate matter (PM_{10}) concentrations and the number of days when PM_{10} concentrations exceed 50µg/m^3, the daily limit value for this pollutant. Exposure to PM_{10} has long been associated with a range of health effects.

The impacts depend on the mitigation measures adopted. This assessment is to identify the risk of dust impacts from a site and to identify appropriate mitigation measures reduce or eliminate the risks.

In this assessment the term ‘impact’ has been used to describe a change in concentration or dust deposition and ‘effect’ to describe the consequences of any impacts.

3.1 POTENTIAL DUST IMPACTS

The main air quality impacts that may arise during demolition and construction activities are:

1. Dust deposition, resulting in the soiling of surfaces;
2. Visible dust plumes, which are evidence of dust emissions;
3. Elevated PM_{10} concentrations, as a result of dust generating activities on site; and
4. An increase in concentrations of airborne particles due to exhaust emissions from diesel powered vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

The most common impacts are dust soiling and increased ambient PM_{10} concentrations due to dust arising from activities on the construction site. Dust soiling will arise from the deposition of dust in all size fractions. The ambient dust relevant to health outcomes will be that measured as PM_{10}, although most of this will be in the coarse ($PM_{2.5-10}$) fraction, rather than the $PM_{2.5}$ fraction.

3.2 DUST

Particles greater than 10µm are likely to settle out relatively quickly and may cause annoyance due to their soiling capability. Although there are no formal standards or criteria for nuisance caused by deposited particles, the IAQM ‘Guidance on Monitoring in the Vicinity of Demolition and Construction Sites’ (October 2018) and the

Environment Agency Technical Guidance Note (TGN) M17 states that dust is usually compared with a 'complaints likely' guideline of 200mg/m^2/day. Therefore, a deposition rate of 200mg/m^2/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.

Construction activities have the potential to suspend dust, which could result in annoyance of residents surrounding the site. Measures will be taken to minimise the emissions of dust as part of good site practice.

3.3 PARTICULATE MATTER (PM_{10} AND $PM_{2.5}$)

PM_{10} and $PM_{2.5}$ are abbreviations for particulate matter suspended in the air.

- PM_{10}: inhalable particles, with diameters that are generally 10 micrometres and smaller; and
- $PM_{2.5}$: fine inhalable particles, with diameters that are generally 2.5 micrometres and smaller.

The UK Air Quality Standards seek to control the health implications of respirable PM_{10} or $PM_{2.5}$. However, the majority of particles released from construction will be greater than this in size.

Construction works on site have the potential to elevate localised PM_{10} or $PM_{2.5}$ concentrations in the area. On this basis, mitigation measures should still be taken to minimise these emissions as part of good site practice.

3.4 RISK OF DUST EMISSIONS

The risk of dust emissions from a demolition/construction site causing loss of amenity and/or health or ecological impacts is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc.);
- The duration of these activity;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activities;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of the receptors to dust.

The quantity of dust emitted from construction operations will be related to the area of land being worked, and the level of construction activity (nature, magnitude and duration). Emissions from construction vehicles passing over unpaved ground can be particularly important.

The wind direction, wind speed and rainfall, at the time when a construction activity is taking place, will also influence whether there is likely to be a dust impact. Adverse impacts can occur in any direction from a site. They are, however, more likely to occur downwind of the prevailing wind direction and/or close to the site.

Dust impacts are more likely to occur during drier periods, as rainfall acts as a natural dust suppressant.

Local conditions will also influence the dust impacts. Topography and natural barriers (e.g. woodland) will reduce airborne concentrations due to impaction.

3.5 POTENTIAL EFFECTS OF DUST EMISSIONS

The main potential effects of dust and particulate matter 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 effects due to inhalation e.g. asthma or irritation of the eyes.

Construction activities can give rise to short-term elevated dust/PM_{10} concentrations in neighbouring areas. This may arise from vehicle movements, soiling of the public highway, demolition or windblown stockpiles.

3.6 RECEPTORS

3.6.1 Human Receptors

A 'human receptor', refers to any location where a person or property may experience the adverse effects of airborne dust or dust soiling or exposure to PM_{10} over a time period relevant to the air quality objectives, as defined in the Government's technical guidance for Local Air Quality Management (LAQM, technical Guidance (TG16) April 2021). In terms of annoyance effects, this will most commonly relate to dwellings, but may also refer to other premises such as buildings housing cultural heritage collections (e.g. museums and galleries), vehicle showrooms, food manufacturers, electronics manufacturers, amenity areas and horticultural operations (e.g. salad or soft-fruit production).

The selection criteria of human receptors are as:

A 'human receptor' within:

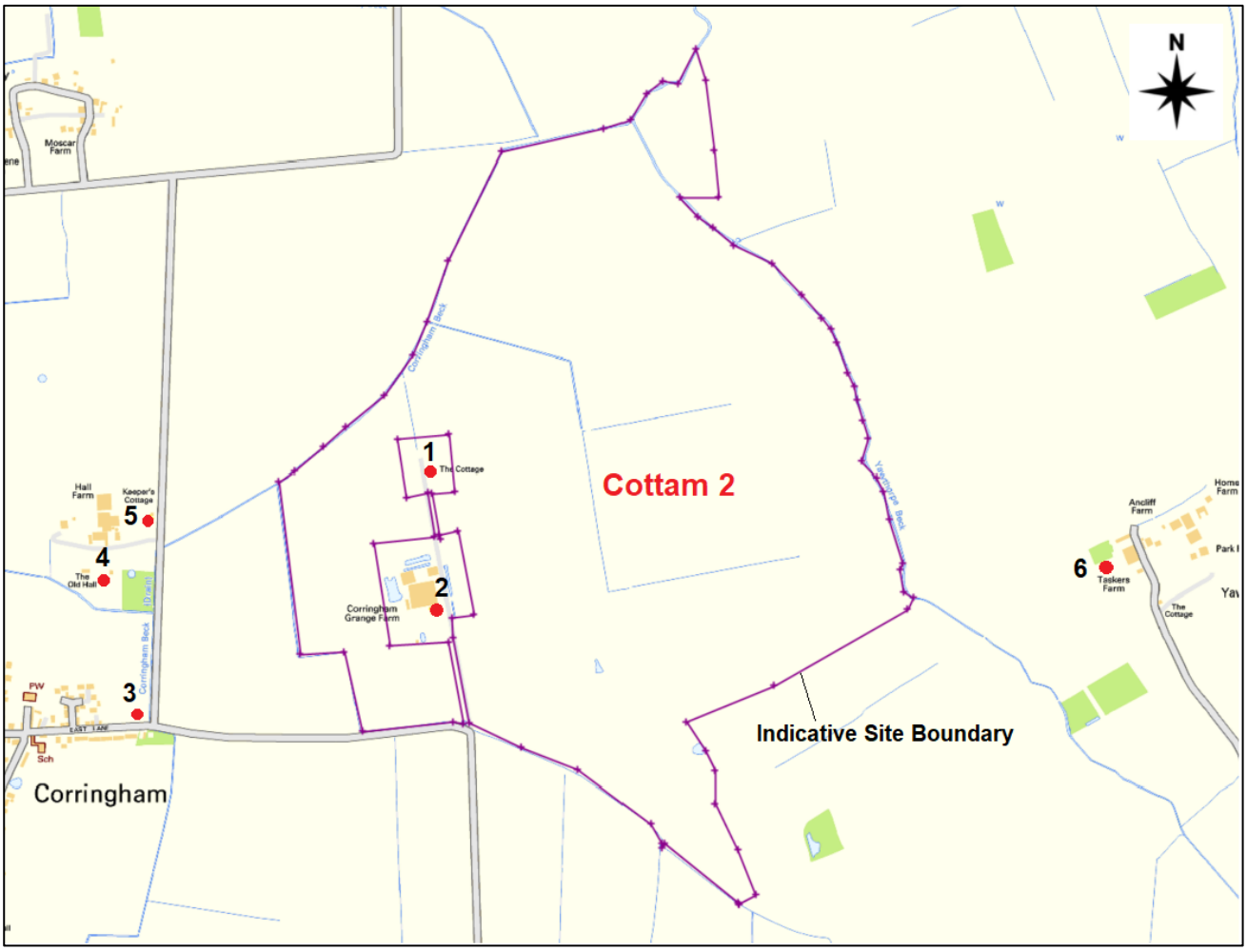
- 350 m of the boundary of the site; or
- 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

Receptors selected within the assessment have been located at the closest surrounding sensitive buildings. A summary of the identified sensitive receptors is presented within **Table 3-1** and **Figure 3-1** below.

Table 3-1 Sensitive Receptors

Site ID	Description	Receptor Type	Location	Approximate Distance from Red-line Boundary (m)
1	The Cottage	Residential	Adjacent to the site boundary/ Surrounded by the Site Boundary	45
2	Corringham Grange Farm	Residential	Adjacent to the site boundary/ Surrounded by the Site Boundary	50
3	25 East Lane	Residential	West of the Site	360
4	The Old Hall	Residential	West of the Site	400
5	Keepers Cottage	Residential	West of the Site	280
6	Taskers Cottage	Residential	North of the Site	430

Figure 3-1 Sensitive Receptor Location Plan



3.6.2 Ecological Receptors

An 'ecological receptor' refers to any sensitive habitat affected by dust soiling (A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1), IAQM, May 2020). This includes the direct impacts on vegetation (A Farmer, 1993, The Effects of Dust on Vegetation - A Review, Environmental Pollution 79, 63-75) or aquatic ecosystems of dust deposition, and the indirect impacts on fauna (e.g. on foraging habitats). For locations with a statutory designation, e.g. Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs), consideration will be given as to whether the site is sensitive to dust, and this will depend on why it has been designated. Some non-statutory sites (i.e. local wildlife sites) and/or locations with very specific sensitivities may also be considered if appropriate.

Dust from demolition and construction sites deposited on vegetation may create ecological stress within the local plant community. During long dry periods dust can coat plant foliage adversely affecting photosynthesis and other biological functions. Rainfall removes the deposited dust from foliage and can rapidly leach chemicals into the soil.

The selection criteria of ecological receptors in IAQM guidance are as:

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

In addition, other relevant guidelines have been used in identify ecological receptors within the vicinity of the site:

- The Conservation of Habitats and Species Regulations (2019) require competent authorities to review planning applications and consents that have the potential to impact on European designated sites (e.g. Special Protection Areas); and
- The IAQM 'A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites' (2020) was utilised within the assessment.

No designated sites (Ecological sites) were Identified for Cottam 2 Site.

3.7 SOURCES, RELEASES, AND IMPACTS

The typical solar farm construction stages may include:

1. Site preparation;
2. Solar array installation;
3. Electrical infrastructure installation;
4. Testing and commissioning; and
5. Completion works.

Dust may be released from each construction stages. Potential hight level dust release may occur at site preparation and completion work stages.

Dust Release Activities

The dust release activities during the site preparation may include:

- Field survey and setting out;
- Laying access roads/ temporary tracks;
- Preparation of earthing system;
- Preparation of foundations/ hard standing for construction compound/ inverter housing/ substation;
- Installation of perimeter fence;
- Construction of foundations/preparation for sub stations and transformer stations;
- Trenching for cables and ditches; and

The dust release activities during the completion works may include:

- Removal of site compound and welfare facilities;
- Landscape planting (grass seeding if required, and hedgerow, existing hedgerow gapping-up, and tree planting); and
- Provision of surface water management system (lined swales/ ditches).

Major Dust Release Sources

Potential high level dust releasing sources are:

a) Laying access roads/temporary tracks, vehicle movements on dry surface of the unpaved roads;
b) Earthworks, soil stripping, and preparation of foundations/ hard standing for construction compound/ inverter housing/ substation, including the operations of machinery, for example, excavators, loader, trucks.
c) Temporary stockpile of soil;
d) Vehicle movements on the earthwork surface.

Once released into the atmosphere, dust can be transported through the air to nearby receptors. Sensitive receptors include humans living within proximity of the proposed site.

3.8 METHODOLOGY

The construction phase assessment utilises the IAQM Guidance on the Assessment of Dust from Demolition and Construction document published in February 2014.

Four construction processes are considered; these are demolition, earthworks, construction and trackout. For each of these phases, the impact description of the potential dust impacts is derived following the determination of a dust emission magnitude and the distance of activities to the nearest sensitive receptor, therefore assessing worst case impacts.

The details of construction phase assessment methodology are presented in Appendix A.

4.0 CONSTRUCTION DUST RISK ASSESSMENT

4.1 WORKS PROGRAMME

The dust risk assessment is considered to represent a worst-case scenario, assuming the potential maximum dust impacts on surrounding receptor locations in accordance with 'Guidance on the Assessment of Dust from Demolition and Construction', IAQM, 2014.

4.2 ASSESSMENT RESULTS

Based on the methodology of '*Step 2A'* in the IAQM guidance, the scale of the anticipated works has determined 'the potential dust emission magnitude' for each process, as presented in **Table 4-1** below.

Table 4-1 Potential Dust Emission Magnitude

Construction Process	Site Criteria	Dust Emission Magnitude
Demolition	No demolition required	N/A
Earthworks	Total Site Area: >10,000 m^2	Large
Construction	Total Building Volume >100,000 m^3	Large
Trackout	Assumed 10 - 50 HDV outward movements in any one day; unpaved road length >100m	Large

The sensitivity of the surrounding area to each construction process has been determined following *'Step 2B'* of the IAQM guidance. The assessment has determined the area sensitivities as shown in **Table 4-2** below.

The sensitivity of the ecological receptors is considered not applicable within the construction phase assessment due to the distance from the application site which is greater than 500m. This is in accordance with *Table 4* of the IAQM Guidance.

Table 4-2 Sensitivity of the Area

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	Low	1 – 10 Highly - Sensitive Receptors within 50m of the site	Low	Annual Mean of <24 ug/m^3 for PM_{10} 1 – 10 Highly Sensitive Receptors within 50m of the site	N/A	N/A
Construction	Low		Low		N/A	
Trackout	Low	1 – 10 Highly - Sensitive Receptors within 50m of the site	Low	Annual Mean of <24 ug/m^3 for PM_{10} 1-10 Highly Sensitive Receptors within 50m of roads within 500m of site	N/A	N/A

The dust emission magnitude determined in **Table 4-1** has been combined with the sensitivity of the area determined in **Table 4-2**, to determine the risk of impacts prior to the implementation of appropriate mitigation measures. The potential impact significance of dust emissions associated with the development without mitigation, using the matrices in Table A4 to Table A7 in Appendix A, is presented in **Table 4-3** below.

Table 4-3 Impact Description of Construction Activities without Mitigation

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

Appropriate mitigation measures are detailed and presented in Section 5. Following the adoption of these measures, the subsequent impact significance of the construction phase is not predicted to be significant.

5.0 SITE-SPECIFIC CONSTRUCTION DUST MITIGATION

5.1 CONSTRUCTION PHASE

The dust risk categories have been determined in Section 4 for each of the construction activities. The assessment has determined that the potential impact description of dust emissions associated with the construction phase of the scheme is 'low risk' at the worst affected receptors.

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 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.

The 'highly recommended' mitigation measures for the scheme are detailed in **Table 5-1**.

The 'desirable' mitigation measures for the scheme are detailed in **Table 5-2**.

Table 5-1 IAQM Guidance on the Assessment of Dust from Demolition and Construction 'Highly Recommended' Mitigation Measures

Communications
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.
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.
Avoid site runoff of water or mud.
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.
Waste management
Avoid bonfires and burning of waste materials.
Measures applicable to specific activities
Earthworks
No Action Required
Construction
No Action Required
Trackout
No Action Required

Table 5-2 IAQM Guidance on the Assessment of Dust from Demolition and Construction 'Desirable' Mitigation Measures

Communications
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 PM_{10} continuous monitoring and/or visual inspections.
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.
Preparing and maintaining the site
Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.
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
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).
Operations
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.
Measures applicable to specific activities
Earthworks
No Action Required
Construction
Avoid scabbling (roughening of concrete surfaces) if possible.
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
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.
Record all inspections of haul routes and any subsequent action in a site log book.
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

Following the implementation of the mitigation measures detailed in the tables above, the impact description of the construction phase is not considered to be significant.

6.0 CONCLUSIONS

Tetra Tech Limited have prepared a qualitative construction dust assessment and a construction dust management plan (CDMP) in support of a planning application for Cottam 2, one of the three land parcels (the 'Site" or 'Sites) described as Cottam 1, 2 and 3 for a proposed solar project (the 'Scheme').

The qualitative construction dust assessment and the CDMP have been produced to meet the requirement within the Planning Inspectorate's Scoping Opinion '*Proposed Cottam Solar Project, Case Reference: EN010133, dated on 09 March 2022*'. The Scoping Opinion states the following:

> *"…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."*

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'.

During the Scheme construction, it is anticipated that dust sensitive receptors will potentially experience increased levels of dust and particulate matter which will result in 'low' risk of impacts without implementation of any mitigation and control measures. Throughout this period, the potential impacts from construction on air quality will be managed through site-specific mitigation measures. With these mitigation measures in place, the effects from the construction of the Cottam 2 Site are not predicted to be significant.

APPENDIX A CONSTRUCTION PHASE ASSESSMENT METHODOLOGY

The following information sets out the adopted approach to the construction phase impact assessment in accordance with the aforementioned IAQM guidance[1].

Step 1 – Screen the Requirement for a more Detailed Assessment

An assessment is required if there are sensitive receptors within 350m of the site boundary, within 50m of the route(s) used by construction vehicles on the surrounding road network, or within 500m from the site entrance. A detailed assessment is also required if there is an ecological receptor within 50m of the site boundary.

Step 2A – Define the Potential Dust Emission Magnitude

Demolition

The dust emission magnitude for the demolition phase has been determined based on the below criteria:

- *Large*: Total building volume >50 000m^3, potentially dusty construction (e.g. concrete), on-site crushing and screening, demolition activities >20m above ground level;
- *Medium*: Total building volume 20 000m^3 – 50 000m^3, potentially dusty construction material, demolition activities 10-20m above ground level; and,
- *Small*: Total building volume <20 000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

Earthworks

The dust emission magnitude for the planned earthworks has been determined based on the below criteria:

- *Large:* Total site area >10 000m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100 000 tonnes;
- *Medium*: Total site area 2 500m^2 – 10 000m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4m-8m in height, total material moved 20 000 tonnes – 100 000 tonnes; and
- *Small:* Total site area <2 500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <10 000 tonnes, earthworks during wetter months.

Construction

The dust emission magnitude for the construction phase has been determined based on the below criteria:

- *Large:* Total building volume >100 000m^3, on site concrete batching; sandblasting
- *Medium:* Total building volume 25 000m^3 – 100 000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and,
- *Small:* Total building volume <25 000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

The dust emission magnitude for trackout has been determined based on the below criteria:

- *Large:* >50 HGV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- *Medium:* 10-50 HGV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and,
- *Small:* <10 HGV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B - Defining the Sensitivity of the Area

Sensitivities of People to Dust Soiling Effects

- *High:*
  - Users can reasonably expect an enjoyment of a high level of amenity;

[1] Institute of Air Quality Management 2014. *Guidance on the Assessment of dust from demolition and construction.*

- The appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably expect to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land; and,
- Indicative examples include dwellings, museums and other culturally important collections, medium- and long-term car parks and car showrooms.

- *Medium:*
  - Users can reasonably expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home;
  - The appearance, aesthetics or value of their property could be diminished by soiling;
  - The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land; and,
  - Indicative examples include parks and places of work.
- *Low:*
  - The enjoyment of amenity would not reasonably be expected;
  - Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling;
  - There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land; and,
  - Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A-1. Sensitivity of the Area to Dust Soiling Effects on People and Property

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

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of People to the Health Effects of PM_{10}

- *High:*
  - Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day);
  - Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.
- *Medium:*
  - Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day); and,
  - Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.
- *Low:*
  - Locations where human exposure is transient; and,
  - Indicative examples include public footpaths, playing fields, parks and shopping streets.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A-2. 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/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28 - 32 µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24 – 28 µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of Receptors to Ecological Effects

- *High:*
  - Locations with an international or national designation and the designated features may be affected by dust soiling;
  - Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain; and,
  - Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
- *Medium:*
  - Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown;
  - Locations with a national designation where the features may be affected by dust deposition; and,
  - Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
- *Low:*
  - Locations with a local designation where the features may be affected by dust deposition; and,
  - Indicative example is a local Nature Reserve with dust sensitive features.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A-3. Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Step 2C - Defining the Risk of Impacts

The risk of impacts with no mitigation is determined by combining the dust emission magnitude determined in Step 2A and the sensitivity of the area determined in Step 2B.

The following tables provide a method of assigning the level of risk for each activity.

Demolition

Table A-4. Risk of Dust Impacts, Demolition

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

Earthworks

Table A-5. Risk of Dust Impacts, Earthworks

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

Construction

Table A-6. Risk of Dust Impacts, Construction

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

Trackout

Table A-7. Risk of Dust Impacts, Trackout

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

Step 3 – Site Specific Mitigation

The dust risk categories for each of the four activities determined in Step 2C should be used to define the appropriate, site-specific mitigation measures to be adopted.

These mitigation measures are contained within section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition and Construction.

APPENDIX B DUST COMPLAINT FORM

Dust Complaint Form

Customer Details	
Customer Name -	
Address – Postcode -	
Customer Contact Details -	
Tel -	
Email -	
Date -	
Complaint Ref Number -	
Complaint Details -	

Investigation Details	
Investigation carried out by -	
Position -	
Date & time investigation carried out -	
Weather conditions -	
Wind direction and speed -	
Investigation findings -	
Feedback given to Environment Agency and/or local authority -	
Date feedback given -	
Feedback given to public -	
Date feedback given -	

Review and Improve	
Improvements needed to prevent a reoccurrence -	
Proposed date for completion of the improvements -	
Actual date for completion -	
If different insert reason for delay -	
Does the dust management plan need to be updated -	
Date that the dust management plan was updated -	

Closure	
Site manager review date	
Site manager signature to confirm no further action required	

APPENDIX C DAILY VISUAL DUST MONITORING REPORT SHEET

Daily Visual Dust Monitoring Report Sheet

Site Manager	Date	Completed by

	Location 1	Location 2	Location 3	Location 4
Start Time				
Wind Speed (m/s)				
Wind Direction				
Visible Dust Soiling (Y/N)				
Additional notes including site operations				
Actions Required?				

APPENDIX D REPORT TERMS & CONDITIONS

This Report has been prepared using reasonable skill and care for the sole benefit of Island Green Power Limited ('the Client') for the proposed uses stated in the report by Tetra Tech Limited ('Tetra Tech'). Tetra Tech exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

No liability is accepted, or warranty given for; unconfirmed data, third party documents and information supplied to Tetra Tech or for the performance, reliability, standing etc. of any products, services, organisations or companies referred to in this report. Tetra Tech does not purport to provide specialist legal, tax or accounting advice.

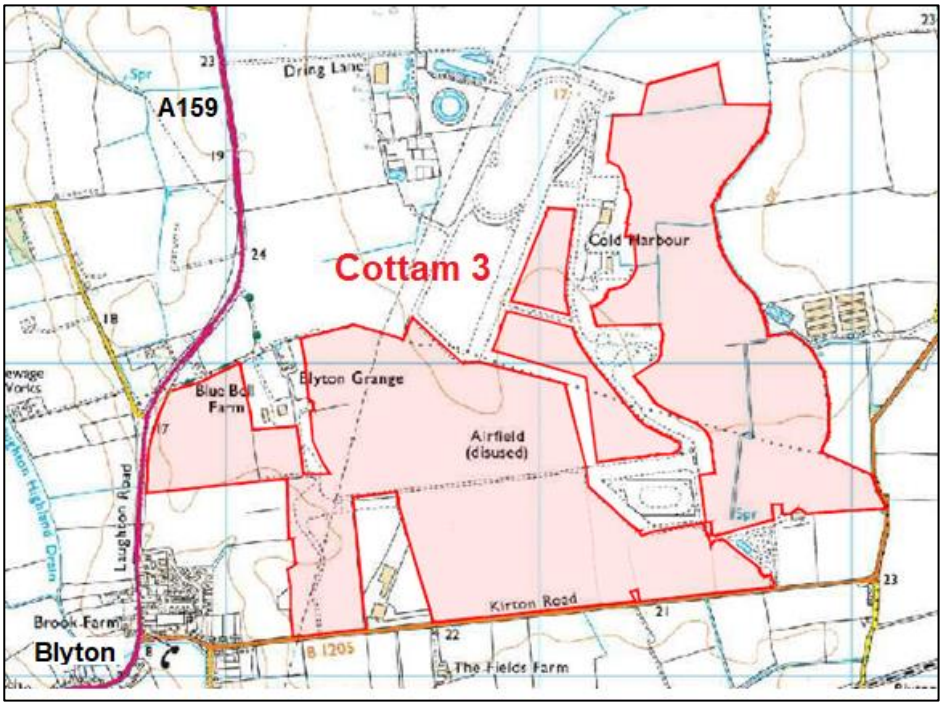
The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary, and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The 'shelf life' of the Report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.

17.3 Cottam 3 Qualitative Dust Assessment and Construction Dust Management Plan

IGP Solar Farms
Cottam 3



Qualitative Dust Assessment and Construction Dust Management Plan (CDMP)

9th May 2022

PRESENTED TO

Island Green Power Limited
Blofield Business Centre
Woodbastwick Road
Norwich
NR13 4RR

PRESENTED BY

NALO, Tetra Tech
Executive Park, Avalon Way, Anstey, Leicester, LE7 7GR
P +44 (0)116 234 8000
tetratecheurope.com

Prepared by:
Dr Zhiyuan Yang 9th May 2022
Principal Environmental Consultant

Reviewed by:
Matthew Smith 9th May 2022
Principal Environmental Consultant

Authorised by:
Nigel Mann 9th May 2022
Director

DOCUMENT CONTROL

Document:	Construction Dust Assessment and DMP
Project:	Cottam 3
Client:	Island Green Power Limited
Job Number:	784-B031438
File Origin:	lds-dc-vm-101\Data\Projects\784-B031437 & 8 West Burton & Cottam Solar Farms

REVISION HISTORY

Issue	Date	Status
1	9th May 2022	First Issue
2		
3		

EXECUTIVE SUMMARY

Tetra Tech Limited have prepared a qualitative construction dust assessment and a construction dust management plan (CDMP) in support of a planning application for Cottam 3, one of the three land parcels (the 'Site" or 'Sites) described as Cottam 1, 2 and 3 for a proposed solar project (the 'Scheme').

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'.

During construction, it is anticipated that dust sensitive receptors will potentially experience increased levels of dust and particulate matter which will result in 'low' to 'medium' risk of impacts without implementation of any mitigation and control measures. The ecological receptors will potentially experience limited increasing levels of dust which will result in a 'medium' risk of impacts without implementation of any mitigation and control measures. However, these are predicted to be short-term and temporary impacts. Throughout this period, the potential impacts from construction on air quality will be managed through site-specific mitigation measures. With these mitigation measures in place, the effects from the construction of the Cottam 2 Site are not predicted to be significant.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
CEMP	Construction Environment Management Plan
CDMP	Construction Dust Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
DEFRA	Department for Environment Food & Rural Affairs
EPUK	Environmental Protection UK
ha	Hectare
HGV	Heavy Goods Vehicle
IAQM	The Institute of Air Quality Management
SAC	Special Areas of Conservation
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
TG	Technical Guidance
TGN	Technical Guidance Note

1.0 INTRODUCTION

Tetra Tech Limited have prepared a qualitative dust assessment and a construction dust management plan (CDMP) in support of a planning application for Cottam 3, one of the three land parcels (the 'Site" or 'Sites) described as Cottam 1, 2and 3, for a proposed solar project (the 'Scheme').The qualitative construction dust assessment and the CDMP are required in accordance with the Planning Inspectorate's Scoping Opinion '*Proposed Cottam Solar Project, Case Reference: EN010133, dated on 09 March 2022*'. The Scoping Opinion – ID 3.18.1 states the following:

> *"…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."*

The aims of a Construction Environmental Management Plan (CEMP) are to outline how a construction project will avoid, minimise or mitigate effects on the environment and surrounding area. The CEMP is designed to cover a number of individual project areas for the entire Scheme, for example, air quality, water quality and drainage, noise and vibration. The purpose of the CDMP is to identify appropriate site-specific mitigation measures in control dust emissions during the Site construction and the CDMP will be produced as a part of the Scheme CEMP.

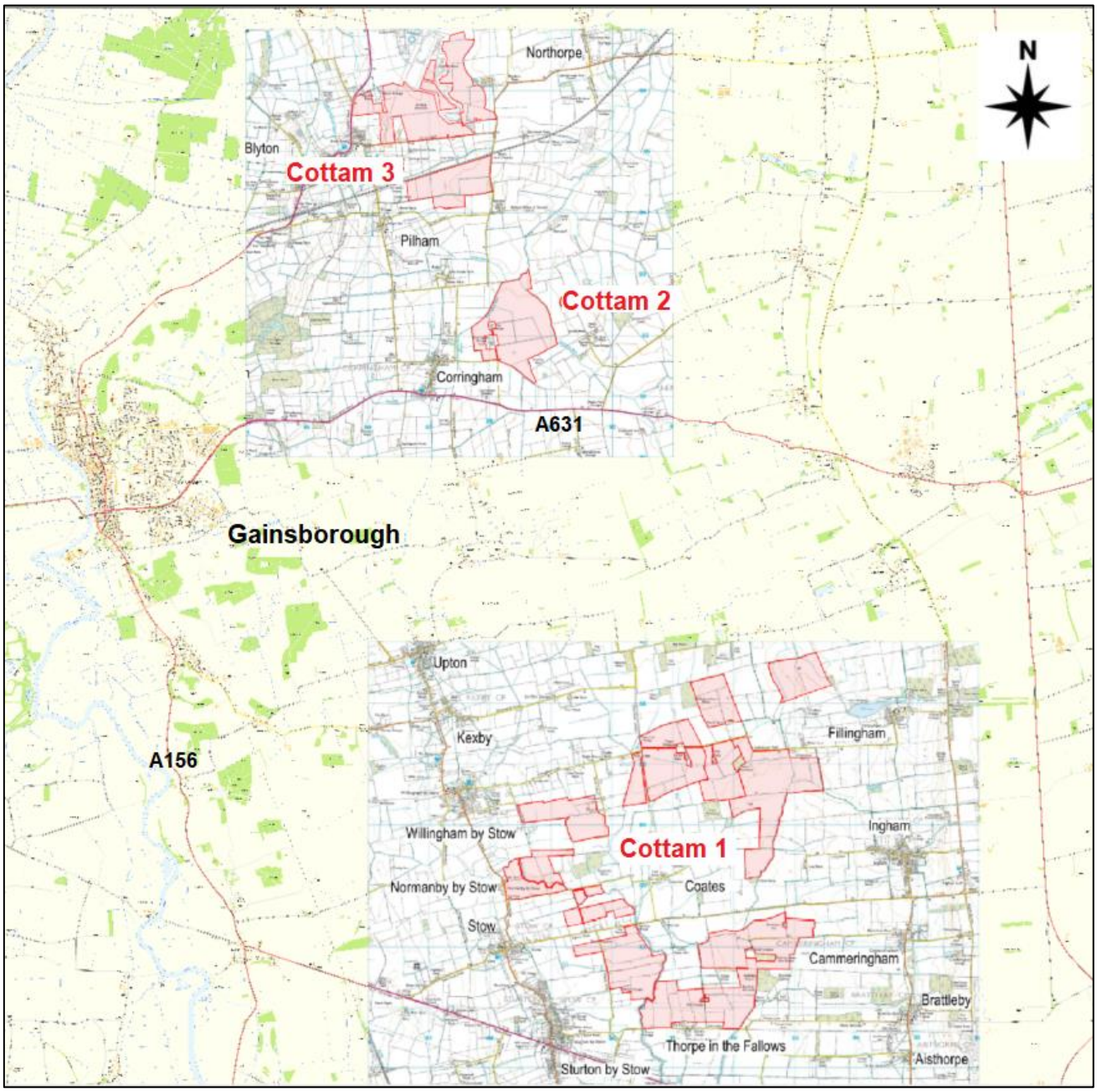
1.1 SITE LOCATION AND CONTEXT

The Scheme comprise a number of land parcels (the 'Site' or 'Sites') described as Cottam 1, 2 and 3 for the solar arrays, grid connection infrastructure and energy storage; and the cable route corridors. The Sites are located approximately 6.5 km south-east and 4 km north-east of Gainsborough.

The majority of the Scheme will be located within the administrative boundary of West Lindsey District Council and Lincolnshire County council

The locations of all three Sites for the overall scheme are shown in **Figure 1-1** (next page).

Figure 1-1 Overall Scheme Plan



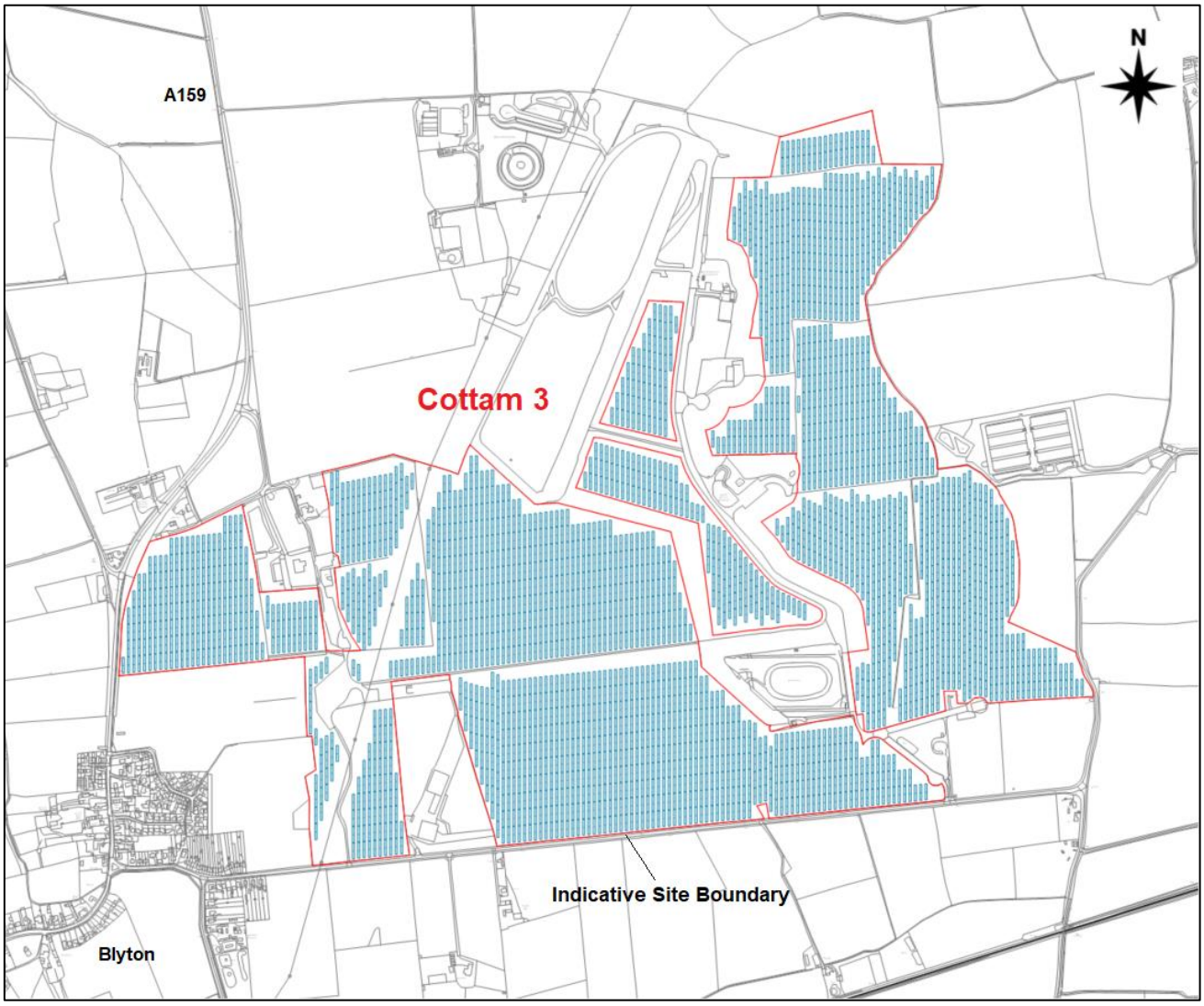
Cottam 3 Site is located to the north of Cottam 2 and to the north-east and south-east of the village of Blyton.

The Cottam 3 Site is approximately 171 ha in area. The entirety of the Cottam 3 is in agricultural use. Isolated parts of the landholding appear to be used for storing materials associated with farming.

The topography at Cottam 3 is relatively flat and the development sites are predominantly well screened from their immediate surroundings by tall hedges around the boundaries of the Sites.

The central Grid Reference Cottam 3 Site is approximately 488480, 3392050. Reference should be made to **Figure 1-2** for a map of the application site and surrounding area.

Figure 1-2 Site and Surrounding Area



The following assessment stages have been undertaken as part of this assessment:

- Policy and legislative context;
- Background;
- Construction dust risk assessment; and
- Site-specific construction dust mitigation.

In the following sections of this report, the assessment considers the potential effects of dust and particulate emissions from Site activities and materials movement during the Site construction phase, based on the construction qualitative risk assessment method detailed in the Institute of Air Quality Management's (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction' document, published in 2014.

2.0 POLICY AND LEGISLATIVE CONTEXT

2.1 DOCUMENTS CONSULTED

The following documents and relevant Legislation and Best Practice Guidance were consulted when undertaking this assessment:

- National Planning Policy Framework, Ministry for Housing, Communities and Local Government, Revised July 2021;
- Planning Practice Guidance: Air Quality, Ministry for Housing, Communities and Local Government, November 2019;
- The Air Quality Standards Regulations (Amendments), 2016;
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Defra, 2007;
- The Environment Act, 1995;
- The Environment Act, 2021;
- Local Air Quality Management Technical Guidance LAQM.TG16, Defra, 2021;
- Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, LA 105 Air quality, Highways England, November 2019;
- Land-Use Planning & Development Control: Planning for Air Quality, EPUK & IAQM, 2017;
- Guidance on the Assessment of Dust from Demolition and Construction, IAQM, 2014;
- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1), IAQM, May 2020; and,
- Ecological Assessment of Air Quality Impacts, CIEEM, January 2021.

Websites Consulted

- Google maps (maps.google.co.uk);
- The UK National Air Quality Archive (www.airquality.co.uk);
- Department for Transport Matrix (www.dft.go.uk/matrix);
- emapsite.com;
- Multi-Agency Geographic Information for the Countryside (http://magic.defra.gov.uk/);
- Planning Practice Guidance (http://planningguidance.planningportal.gov.uk/); and
- West Lindsey District Council (https://www.west-lindsey.gov.uk/).

3.0 BACKGROUND

Emissions of dust to air can occur during the preparation of the land (e.g. demolition, land clearing, and earth moving), and during construction. Emissions can vary substantially from day to day, depending on the level of activity, the specific operations being undertaken, and the weather conditions. A large proportion of the emissions result from site plant and road vehicles moving over temporary roads and open ground. If mud is allowed to get onto local roads, dust emissions can occur at some distance from the originating site. The scale of these impacts depends on the dust suppression and other mitigation measures applied (Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management (IAQM), Version 1.1, 1st June 2016).

In terms of effects, construction sites can also give rise to annoyance due to the soiling of surfaces by dust. Very high levels of soiling can also damage plants and affect the diversity of ecosystems. Additionally, there is evidence of major construction sites increasing long term particulate matter (PM_{10}) concentrations and the number of days when PM_{10} concentrations exceed 50µg/m^3, the daily limit value for this pollutant. Exposure to PM_{10} has long been associated with a range of health effects.

The impacts depend on the mitigation measures adopted. This assessment is to identify the risk of dust impacts from a site and to identify appropriate mitigation measures reduce or eliminate the risks.

In this assessment the term ‘impact’ has been used to describe a change in concentration or dust deposition and ‘effect’ to describe the consequences of any impacts.

3.1 POTENTIAL DUST IMPACTS

The main air quality impacts that may arise during demolition and construction activities are:

1. Dust deposition, resulting in the soiling of surfaces;
2. Visible dust plumes, which are evidence of dust emissions;
3. Elevated PM_{10} concentrations, as a result of dust generating activities on site; and
4. An increase in concentrations of airborne particles due to exhaust emissions from diesel powered vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

The most common impacts are dust soiling and increased ambient PM_{10} concentrations due to dust arising from activities on the construction site. Dust soiling will arise from the deposition of dust in all size fractions. The ambient dust relevant to health outcomes will be that measured as PM_{10}, although most of this will be in the coarse ($PM_{2.5-10}$) fraction, rather than the $PM_{2.5}$ fraction.

3.2 DUST

Particles greater than 10µm are likely to settle out relatively quickly and may cause annoyance due to their soiling capability. Although there are no formal standards or criteria for nuisance caused by deposited particles, the IAQM ‘Guidance on Monitoring in the Vicinity of Demolition and Construction Sites’ (October 2018) and the

Environment Agency Technical Guidance Note (TGN) M17 states that dust is usually compared with a 'complaints likely' guideline of 200mg/m^2/day. Therefore, a deposition rate of 200mg/m^2/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.

Construction activities have the potential to suspend dust, which could result in annoyance of residents surrounding the site. Measures will be taken to minimise the emissions of dust as part of good site practice.

3.3 PARTICULATE MATTER (PM_{10} AND $PM_{2.5}$)

PM_{10} and $PM_{2.5}$ are abbreviations for particulate matter suspended in the air.

- PM_{10}: inhalable particles, with diameters that are generally 10 micrometres and smaller; and
- $PM_{2.5}$: fine inhalable particles, with diameters that are generally 2.5 micrometres and smaller.

The UK Air Quality Standards seek to control the health implications of respirable PM_{10} or $PM_{2.5}$. However, the majority of particles released from construction will be greater than this in size.

Construction works on site have the potential to elevate localised PM_{10} or $PM_{2.5}$ concentrations in the area. On this basis, mitigation measures should still be taken to minimise these emissions as part of good site practice.

3.4 RISK OF DUST EMISSIONS

The risk of dust emissions from a demolition/construction site causing loss of amenity and/or health or ecological impacts is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc.);
- The duration of these activity;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activities;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of the receptors to dust.

The quantity of dust emitted from construction operations will be related to the area of land being worked, and the level of construction activity (nature, magnitude and duration). Emissions from construction vehicles passing over unpaved ground can be particularly important.

The wind direction, wind speed and rainfall, at the time when a construction activity is taking place, will also influence whether there is likely to be a dust impact. Adverse impacts can occur in any direction from a site. They are, however, more likely to occur downwind of the prevailing wind direction and/or close to the site.

Dust impacts are more likely to occur during drier periods, as rainfall acts as a natural dust suppressant.

Local conditions will also influence the dust impacts. Topography and natural barriers (e.g. woodland) will reduce airborne concentrations due to impaction.

3.5 POTENTIAL EFFECTS OF DUST EMISSIONS

The main potential effects of dust and particulate matter 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 effects due to inhalation e.g. asthma or irritation of the eyes.

Construction activities can give rise to short-term elevated dust/PM_{10} concentrations in neighbouring areas. This may arise from vehicle movements, soiling of the public highway, demolition or windblown stockpiles.

3.6 RECEPTORS

3.6.1 Human Receptors

A 'human receptor', refers to any location where a person or property may experience the adverse effects of airborne dust or dust soiling or exposure to PM_{10} over a time period relevant to the air quality objectives, as defined in the Government's technical guidance for Local Air Quality Management (LAQM, technical Guidance (TG16) April 2021). In terms of annoyance effects, this will most commonly relate to dwellings, but may also refer to other premises such as buildings housing cultural heritage collections (e.g. museums and galleries), vehicle showrooms, food manufacturers, electronics manufacturers, amenity areas and horticultural operations (e.g. salad or soft-fruit production).

The selection criteria of human receptors are as:

A 'human receptor' within:

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

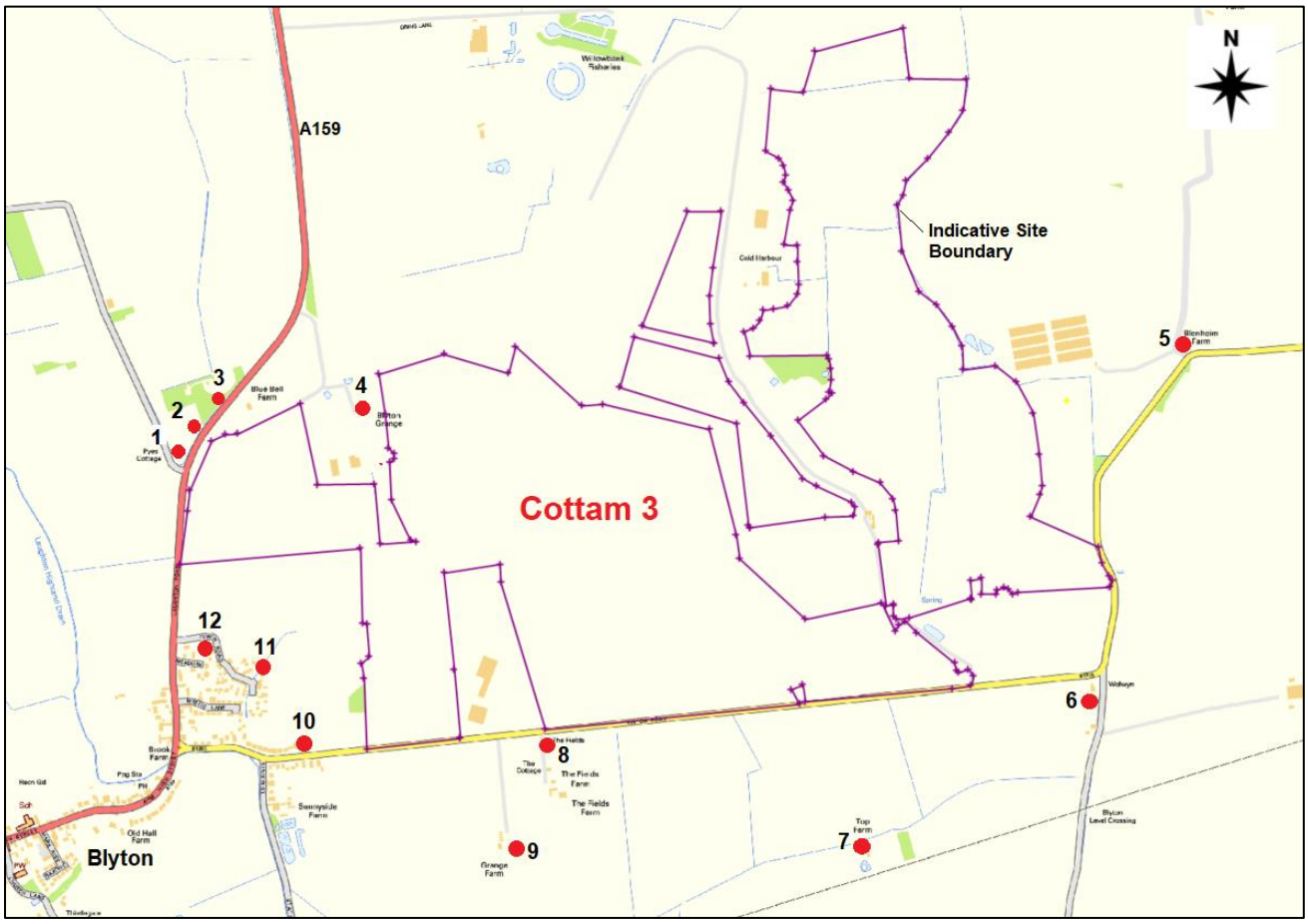
Receptors selected within the assessment have been located at the closest surrounding sensitive buildings. A summary of the identified sensitive receptors is presented within **Table 3-1** and **Figure 3-1** below.

Table 3-1 Sensitive Receptors

Site ID	Description	Receptor Type	Location	Approximate Distance from Red-line Boundary (m)
1	Inglenook	Residential	West of the Site	65
2	Grace Park Managers Residence	Residential	West of the Site	50
3	Grace Park Caravan and Camping Site	Residential	West of the Site	130
4	Blyton Grange	Residential	Adjacent to the site boundary/ Surrounded by the Site Boundary	40
5	Blenheim Farm	Residential	East of the Site	410
6	El-Bon	Residential	South of the Site	310

7	Top Farm	Residential	South of the Site	380
8	The Fields	Residential	South of the Site	35
9	Grange Farm	Residential	South of the Site	300
10	65 Kirton Road	Residential	West of the Site	120
11	41 Irwin Road	Residential	West of the Site	250
12	3 Irwin Road	Residential	West of the Site	200

Figure 3-1 Sensitive Receptor Location Plan



3.6.2 Ecological Receptors

An 'ecological receptor' refers to any sensitive habitat affected by dust soiling (A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1), IAQM, May 2020). This includes the direct impacts on vegetation (A Farmer, 1993, The Effects of Dust on Vegetation - A Review, Environmental Pollution 79, 63-75) or aquatic ecosystems of dust deposition, and the indirect impacts on fauna (e.g. on foraging habitats). For locations with a statutory designation, e.g. Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs), consideration will be given as to whether the site is sensitive to dust, and this will depend on why it has been designated. Some non-statutory sites (i.e. local wildlife sites) and/or locations with very specific sensitivities may also be considered if appropriate.

Dust from demolition and construction sites deposited on vegetation may create ecological stress within the local plant community. During long dry periods dust can coat plant foliage adversely affecting photosynthesis and other biological functions. Rainfall removes the deposited dust from foliage and can rapidly leach chemicals into the soil.

The selection criteria of ecological receptors in IAQM guidance are as:

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

In addition, other relevant guidelines have been used in identify ecological receptors within the vicinity of the site:

- The Conservation of Habitats and Species Regulations (2019) require competent authorities to review planning applications and consents that have the potential to impact on European designated sites (e.g. Special Protection Areas); and
- The IAQM 'A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites' (2020) was utilised within the assessment.

Following designated site(s) (ecological sites) were identified:

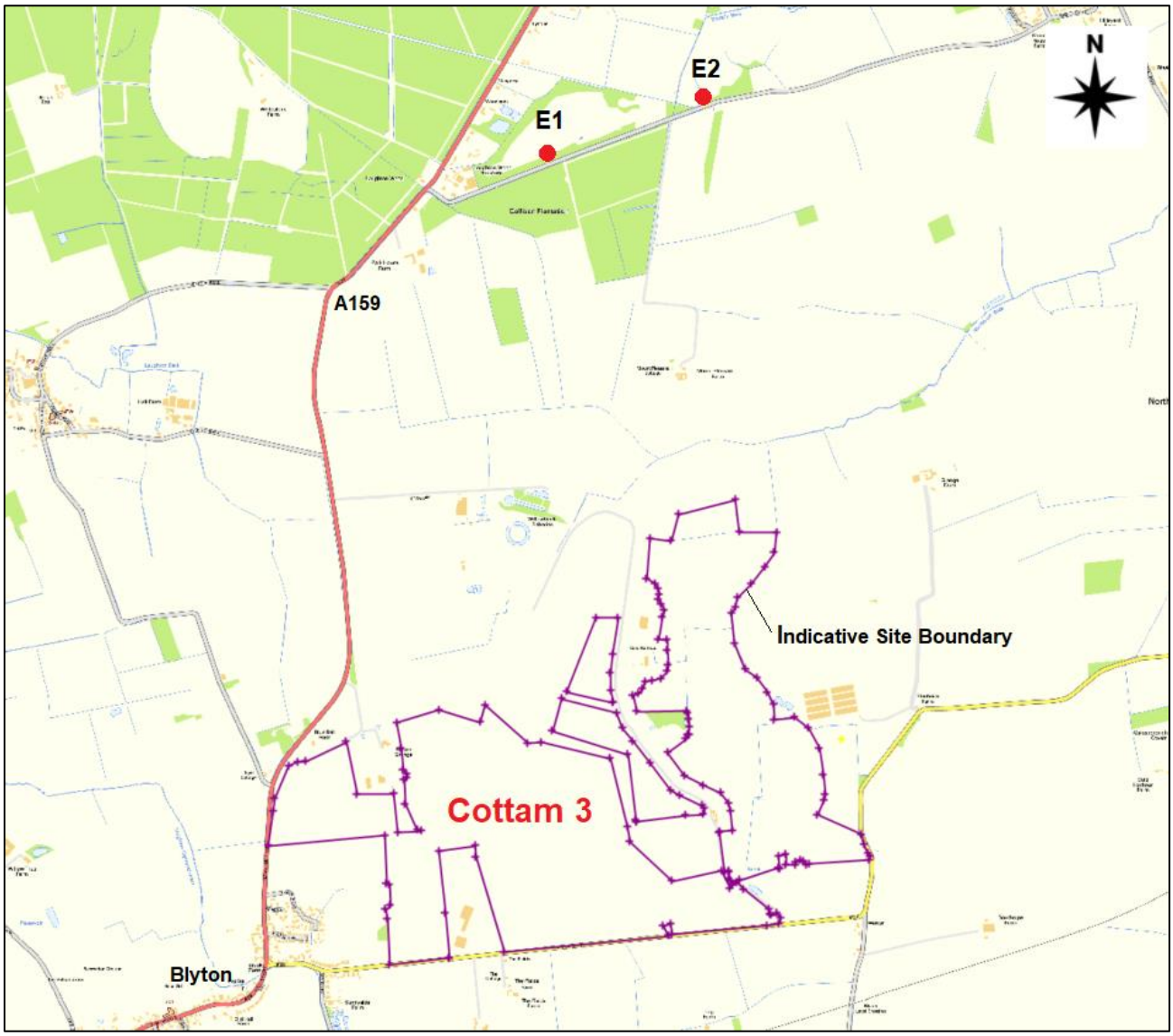
- Scotton Common (SSSI) - located approximately 1500m north of the Site. The habitat contains dwarf shrub heath – lowland; and
- Scotton Beck Fields (SSSI) - located approximately 1560m north of the Site. The habitat contains Acid grassland – lowland.

The ecological receptors that were selected within the assessment are presented within **Table 3-2** and **Figure 3-2**.

Table 3-2. Ecological Sensitive Receptor Location

Site ID	Site	Designation	UK NGR (m)		Distance from Site (m)
			X	Y	
E1	Scotton Common (SSSI)	SSSI	486840	398295	1,500
E2	Scotton Beck Fields (SSSI)	SSSI	487460	398520	1,560

Figure 3-2. Ecological Receptor Location Plan



3.7 SOURCES, RELEASES, AND IMPACTS

The typical solar farm construction stages may include:

1. Site preparation;
2. Solar array installation;
3. Electrical infrastructure installation;
4. Testing and commissioning; and
5. Completion works.

Dust may be released from each construction stages. Potential hight level dust release may occur at site preparation and completion work stages.

Dust Release Activities

The dust release activities during the site preparation may include:

- Field survey and setting out;
- Laying access roads/ temporary tracks;
- Preparation of earthing system;
- Preparation of foundations/ hard standing for construction compound/ inverter housing/ substation;
- Installation of perimeter fence;
- Construction of foundations/preparation for sub stations and transformer stations;
- Trenching for cables and ditches; and

The dust release activities during the completion works may include:

- Removal of site compound and welfare facilities;
- Landscape planting (grass seeding if required, and hedgerow, existing hedgerow gapping-up, and tree planting); and
- Provision of surface water management system (lined swales/ ditches).

Major Dust Release Sources

Potential high level dust releasing sources are:

a) Laying access roads/temporary tracks, vehicle movements on dry surface of the unpaved roads;
b) Earthworks, soil stripping, and preparation of foundations/ hard standing for construction compound/ inverter housing/ substation, including the operations of machinery, for example, excavators, loader, trucks.
c) Temporary stockpile of soil;
d) Vehicle movements on the earthwork surface.

Once released into the atmosphere, dust can be transported through the air to nearby receptors. Sensitive receptors include humans living within proximity of the proposed site.

3.8 METHODOLOGY

The construction phase assessment utilises the IAQM Guidance on the Assessment of Dust from Demolition and Construction document published in February 2014.

Four construction processes are considered; these are demolition, earthworks, construction and trackout. For each of these phases, the impact description of the potential dust impacts is derived following the determination of a dust emission magnitude and the distance of activities to the nearest sensitive receptor, therefore assessing worst case impacts.

The details of construction phase assessment methodology are presented in Appendix A.

4.0 CONSTRUCTION DUST RISK ASSESSMENT

4.1 WORKS PROGRAMME

The dust risk assessment is considered to represent a worst-case scenario, assuming the potential maximum dust impacts on surrounding receptor locations in accordance with 'Guidance on the Assessment of Dust from Demolition and Construction', IAQM, 2014.

4.2 ASSESSMENT RESULTS

Based on the methodology of '*Step 2A'* in the IAQM guidance, the scale of the anticipated works has determined 'the potential dust emission magnitude' for each process, as presented in **Table 4-1** below.

Table 4-1 Potential Dust Emission Magnitude

Construction Process	Site Criteria	Dust Emission Magnitude
Demolition	No demolition required	N/A
Earthworks	Total Site Area: >10,000 m^2	Large
Construction	Total Building Volume >100,000 m^3	Large
Trackout	Assumed 10 - 50 HDV outward movements in any one day; unpaved road length >100m	Large

The sensitivity of the surrounding area to each construction process has been determined following *'Step 2B'* of the IAQM guidance. The assessment has determined the area sensitivities as shown in **Table 4-2** below.

The sensitivity of the ecological receptors is considered not applicable within the construction phase assessment due to the distance from the application site which is greater than 500m. This is in accordance with *Table 4* of the IAQM Guidance.

Table 4-2 Sensitivity of the Area

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	Low	>50 m from site boundary
Construction	Medium		Low		Low	
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	Low	>50 from site boundary

The dust emission magnitude determined in **Table 4-1** has been combined with the sensitivity of the area determined in **Table 4-2**, to determine the risk of impacts prior to the implementation of appropriate mitigation measures. The potential impact significance of dust emissions associated with the development without mitigation, using the matrices in Table A4 to Table A7 in Appendix A, is presented in **Table 4-3** below.

Table 4-3 Impact Description of Construction Activities without Mitigation

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	Low
Construction	Medium	Low	Low
Trackout	Medium	Low	Low

Appropriate mitigation measures are detailed and presented in Section 5. Following the adoption of these measures, the subsequent impact significance of the construction phase is not predicted to be significant.

5.0 SITE-SPECIFIC CONSTRUCTION DUST MITIGATION

5.1 CONSTRUCTION PHASE

The dust risk categories have been determined in Section 4 for each of the construction activities. The assessment has determined that the potential impact description of dust emissions associated with the construction phase of the scheme range from 'low risk' to 'medium risk' at the worst affected receptors.

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 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.

The 'highly recommended' mitigation measures for the scheme are detailed in **Table 5-1**.

The 'desirable' mitigation measures for the scheme are detailed in **Table 5-2**.

Table 5-1 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 PM_{10} 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 actives 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.

Table 5-2 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.

Following the implementation of the mitigation measures detailed in the tables above, the impact description of the construction phase is not considered to be significant.

6.0 CONCLUSIONS

Tetra Tech Limited have prepared a qualitative construction dust assessment and a construction dust management plan (CDMP) in support of a planning application for Cottam 3, one of the three land parcels (the 'Site" or 'Sites) described as Cottam 1, 2 and 3 for a proposed solar project (the 'Scheme').

The qualitative construction dust assessment and the CDMP have been produced to meet the requirement within the Planning Inspectorate's Scoping Opinion '*Proposed Cottam Solar Project, Case Reference: EN010133, dated on 09 March 2022*'. The Scoping Opinion states the following:

> *"…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."*

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'.

During the Scheme construction, it is anticipated that dust sensitive receptors will potentially experience increased levels of dust and particulate matter which will result in 'low' to 'medium' risk of impacts without implementation of any mitigation and control measures. The ecological receptors will potentially experience limited increasing levels of dust which will result in 'low' risk of impacts without implementation of any mitigation and control measures. However, these are predicted to be short-term and temporary impacts. Throughout this period, the potential impacts from construction on air quality will be managed through site-specific mitigation measures. With these mitigation measures in place, the effects from the construction of the Cottam 3 Site are not predicted to be significant.

APPENDIX A CONSTRUCTION PHASE ASSESSMENT METHODOLOGY

The following information sets out the adopted approach to the construction phase impact assessment in accordance with the aforementioned IAQM guidance[1].

Step 1 – Screen the Requirement for a more Detailed Assessment

An assessment is required if there are sensitive receptors within 350m of the site boundary, within 50m of the route(s) used by construction vehicles on the surrounding road network, or within 500m from the site entrance. A detailed assessment is also required if there is an ecological receptor within 50m of the site boundary.

Step 2A – Define the Potential Dust Emission Magnitude

Demolition

The dust emission magnitude for the demolition phase has been determined based on the below criteria:

- *Large*: Total building volume >50 000m^3, potentially dusty construction (e.g. concrete), on-site crushing and screening, demolition activities >20m above ground level;
- *Medium*: Total building volume 20 000m^3 – 50 000m^3, potentially dusty construction material, demolition activities 10-20m above ground level; and,
- *Small*: Total building volume <20 000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

Earthworks

The dust emission magnitude for the planned earthworks has been determined based on the below criteria:

- *Large:* Total site area >10 000m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100 000 tonnes;
- *Medium*: Total site area 2 500m^2 – 10 000m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4m-8m in height, total material moved 20 000 tonnes – 100 000 tonnes; and
- *Small:* Total site area <2 500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <10 000 tonnes, earthworks during wetter months.

Construction

The dust emission magnitude for the construction phase has been determined based on the below criteria:

- *Large:* Total building volume >100 000m^3, on site concrete batching; sandblasting
- *Medium:* Total building volume 25 000m^3 – 100 000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and,
- *Small:* Total building volume <25 000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

The dust emission magnitude for trackout has been determined based on the below criteria:

- *Large:* >50 HGV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- *Medium:* 10-50 HGV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and,
- *Small:* <10 HGV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B - Defining the Sensitivity of the Area

Sensitivities of People to Dust Soiling Effects

- *High:*
  - Users can reasonably expect an enjoyment of a high level of amenity;

[1] Institute of Air Quality Management 2014. *Guidance on the Assessment of dust from demolition and construction.*

- The appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably expect to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land; and,
- Indicative examples include dwellings, museums and other culturally important collections, medium- and long-term car parks and car showrooms.

- *Medium:*
  - Users can reasonably expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home;
  - The appearance, aesthetics or value of their property could be diminished by soiling;
  - The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land; and,
  - Indicative examples include parks and places of work.
- *Low:*
  - The enjoyment of amenity would not reasonably be expected;
  - Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling;
  - There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land; and,
  - Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A-1. Sensitivity of the Area to Dust Soiling Effects on People and Property

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

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of People to the Health Effects of PM_{10}

- *High:*
  - Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day);
  - Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.
- *Medium:*
  - Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day); and,
  - Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.
- *Low:*
  - Locations where human exposure is transient; and,
  - Indicative examples include public footpaths, playing fields, parks and shopping streets.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A-2. 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/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28 - 32 µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24 – 28 µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of Receptors to Ecological Effects

- *High:*
  - Locations with an international or national designation and the designated features may be affected by dust soiling;
  - Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain; and,
  - Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
- *Medium:*
  - Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown;
  - Locations with a national designation where the features may be affected by dust deposition; and,
  - Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
- *Low:*
  - Locations with a local designation where the features may be affected by dust deposition; and,
  - Indicative example is a local Nature Reserve with dust sensitive features.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A-3. Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Step 2C - Defining the Risk of Impacts

The risk of impacts with no mitigation is determined by combining the dust emission magnitude determined in Step 2A and the sensitivity of the area determined in Step 2B.

The following tables provide a method of assigning the level of risk for each activity.

Demolition

Table A-4. Risk of Dust Impacts, Demolition

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

Earthworks

Table A-5. Risk of Dust Impacts, Earthworks

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

Construction

Table A-6. Risk of Dust Impacts, Construction

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

Trackout

Table A-7. Risk of Dust Impacts, Trackout

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

Step 3 – Site Specific Mitigation

The dust risk categories for each of the four activities determined in Step 2C should be used to define the appropriate, site-specific mitigation measures to be adopted.

These mitigation measures are contained within section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition and Construction.

APPENDIX B DUST COMPLAINT FORM

Dust Complaint Form

Customer Details	
Customer Name -	
Address – Postcode -	
Customer Contact Details -	
Tel -	
Email -	
Date -	
Complaint Ref Number -	
Complaint Details -	

Investigation Details	
Investigation carried out by -	
Position -	
Date & time investigation carried out -	
Weather conditions -	
Wind direction and speed -	
Investigation findings -	
Feedback given to Environment Agency and/or local authority -	
Date feedback given -	
Feedback given to public -	
Date feedback given -	

Review and Improve	
Improvements needed to prevent a reoccurrence -	
Proposed date for completion of the improvements -	
Actual date for completion -	
If different insert reason for delay -	
Does the dust management plan need to be updated -	
Date that the dust management plan was updated -	

Closure	
Site manager review date	
Site manager signature to confirm no further action required	

APPENDIX C DAILY VISUAL DUST MONITORING REPORT SHEET

Daily Visual Dust Monitoring Report Sheet

Site Manager	Date	Completed by

	Location 1	Location 2	Location 3	Location 4
Start Time				
Wind Speed (m/s)				
Wind Direction				
Visible Dust Soiling (Y/N)				
Additional notes including site operations				
Actions Required?				

APPENDIX D REPORT TERMS & CONDITIONS

This Report has been prepared using reasonable skill and care for the sole benefit of Island Green Power Limited ('the Client') for the proposed uses stated in the report by Tetra Tech Limited ('Tetra Tech'). Tetra Tech exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

No liability is accepted, or warranty given for; unconfirmed data, third party documents and information supplied to Tetra Tech or for the performance, reliability, standing etc. of any products, services, organisations or companies referred to in this report. Tetra Tech does not purport to provide specialist legal, tax or accounting advice.

The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary, and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The 'shelf life' of the Report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.