



WHITESTONE
solar farm

WHITESTONE SOLAR FARM

Environmental Statement

6.20 Appendix 9.11: Coal Mining Risk Assessment: Whitestone 2

Application Document ref. EN0110020/APP/6.20
Revision 01
June 2026

Planning Act (2008)
Infrastructure Planning (Applications:
Prescribed Forms and Procedure)
Regulations 2009
Regulations 5(2)(a)

whitstonesolarfarm.co.uk

ENVIRONMENTAL STATEMENT

Document Status					
Version	Purpose of Document	Authored by	Reviewed by	Approved by	Review Date
Rev01	DCO Submission	ERM	TLT, Pershing, DWD, Whitestone Net Zero Ltd	Whitestone Net Zero Ltd	01/06/20 26

Approval for Issue		
Whitestone Net Zero Ltd		1 June 2026

The following report and supporting infographics have been produced by human authors. Artificial Intelligence (AI) has not been used to create or alter the technical meaning of these materials. ERM is technology-enabled and may use technology including AI in service delivery, in compliance with all laws applicable to it. Where AI has been used as an administrative support function, this has been appropriately validated by human authors.

ERM take full ownership and responsibility for the report, notwithstanding that ancillary technology (including AI tools) may have been used in service provision.

Prepared by:

ERM

Prepared for:

Whitestone Net Zero Ltd

Contents

9.11 Coal Mining Risk Assessment: Whitestone 2.....4

Figures [EN0110020/APP/6.19]

Figure Number	Figure Title
3.1	Order Limits
3.2	Site Referencing
3.4	Environmental Designations
9.1	Study Area
9.2	ALC Study Area
9.3	Coal Mining High Risk Development Areas
9.4	Mineral Safeguard Areas
9.5	SPZ and Ground Water Abstractions
9.7.1	Map of Potentially Contaminated Sites
9.10.1	Superficial Geology
9.10.2	Bedrock Geology
9.10.3	Bore Hole Locations

Appendices [EN0110020/APP/6.20]

Appendix Number	Appendix Title
9.1	Legislation, Policy and Guidance
9.2	Landmark Envirocheck® Report: W1
9.3	Landmark Envirocheck® Report: W2
9.4	Landmark Envirocheck® Report: W3
9.5	Landmark Envirocheck® Report for Cable Corridors
9.6	Agricultural Land Classification Report
9.7	Phase 1 Contaminated Land Report: W1
9.8	Phase 1 Contaminated Land Report: W2
9.9	Phase 1 Contaminated Land Report: W3
9.10	Phase 1 Coal Mining Risk Assessment: W1
9.11	Phase 1 Coal Mining Risk Assessment: W2
9.12	Phase 1 Coal Mining Risk Assessment: W3

Glossary

Term	Meaning
<i>Aquifer</i>	“Underground layers of water-bearing, permeable rock from which groundwater can be extracted” (British Geological Survey).

ENVIRONMENTAL STATEMENT

Term	Meaning
<i>Cable Corridors</i>	Corridors within which the high voltage cables would be constructed.
<i>Environmental Statement (ES)</i>	The Environmental Statement which presents the environmental information relating to the Proposed Development. The ES has been prepared to present information for formal consultation in accordance with current EIA regulation.
<i>Made Ground</i>	Land where the pre-existing ground surface is raised or replaced by artificial or man-made deposits.
<i>Order Limits</i>	Maximum extent of the Proposed Development comprising the Site and Cable Corridors.
<i>Secondary Aquifer</i>	Rocks which “can provide modest amounts of water, but the nature of the rock or the aquifer’s structure limits their use. They support water supplies at a local rather than strategic scale (such as for private supplies) and remain important for rivers, wetlands and lakes. They have a wide range of water permeability and storage” (Environment Agency). Secondary Aquifers may be further classified as ‘A’, ‘B’ or ‘Undifferentiated’ based on their permeability and ability to support local water supplies and/or base flow to rivers.
<i>Study Area</i>	This is an area which is defined for each environmental topic which includes the Order Limits as well as potential spatial and temporal considerations of the impacts on relevant receptors.
<i>The Applicant</i>	Whitestone Net Zero Ltd
<i>The Application</i>	The Application submitted to the Secretary of State for a Development Consent Order.
<i>The Proposed Development</i>	The proposed Whitestone Solar Farm.
<i>The Site</i>	The land planned to be used for solar PV array and associated infrastructure, BESS, substation, and landscaping and habitat enhancement. The Site is split into W1, W2, and W3.
<i>Whitestone 1 (W1)</i>	The northern parcels of the Whitestone Solar Farm.
<i>Whitestone 2 (W2)</i>	The middle parcels of the Whitestone Solar Farm.
<i>Whitestone 3 (W3)</i>	The southern parcels of the Whitestone Solar Farm.

Acronyms

Acronym	Meaning
<i>AIL</i>	Abnormal Indivisible Load
<i>BESS</i>	Battery Energy Storage System
<i>BGL</i>	Below Ground Level
<i>BGS</i>	British Geological Society
<i>DCO</i>	Development Consent Order
<i>ERM</i>	Environmental Resources Management
<i>ES</i>	Environmental Statement
<i>NSIP</i>	Nationally Significant Infrastructure Project

ENVIRONMENTAL STATEMENT

Acronym	Meaning
<i>PCS</i>	Power Conversion System
<i>PV</i>	Photovoltaic
<i>SAC</i>	Special Areas of Conservation
<i>SPA</i>	Special Protection Area
<i>SSSI</i>	Sites of Special Scientific Information
<i>W1</i>	Whitestone 1
<i>W2</i>	Whitestone 2
<i>W3</i>	Whitestone 3

Units

Units	Meaning
<i>ha</i>	Hectares
<i>km</i>	Kilometres
<i>kV</i>	Kilovolt
<i>m</i>	Metres
<i>MW</i>	Megawatts

9.11 Coal Mining Risk Assessment: Whitestone 2

Introduction

- 9.11.1 This Appendix of the Environmental Statement (ES) has been prepared by Environmental Resources Management (ERM) on behalf of Whitestone Net Zero Ltd (the Applicant) in relation to the Development Consent Order (DCO) Application for the construction, operation, maintenance and decommissioning of the Whitestone Solar Farm (the Proposed Development). It is understood that the Applicant wishes to understand the potential structural stability risks for redevelopment activities that may be undertaken in relation to the Proposed Development.

Order Limits

- 9.11.2 The extent of the Order Limits are described in **ES Volume 1, Chapter 3: The Site and Surrounding Area [EN0110020/APP/6.3]** and shown in **ES Volume 3, Figure 3.1: Order Limits [EN0110020/APP/6.19]**. The Proposed Development is described in **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** and shown spatially on the **Works Plans [EN0110020/APP/2.3]**.

The Proposed Development

- 9.11.3 The Proposed Development involves the construction, operation and maintenance, and decommissioning of more than 100 megawatt (MW) of solar photovoltaic (PV) array, Battery Energy Storage System (BESS), onsite substations and supporting infrastructure, and grid connection infrastructure. The grid connection infrastructure would connect the Proposed Development to the new 400 kilovolt (kV) National Grid substation proposed on land immediately east of Long Lane, Brinsworth, S60 4JJ (Long Lane 400kV Substation). National Grid have applied to Rotherham Metropolitan Borough Council for the development of this new substation which is intended by National Grid to be operational in time for the Proposed Development to connect in 2029. This substation is therefore not included in the Proposed Development and will be subject to a separate planning application taken forward by National Grid.
- 9.11.4 As the Proposed Development would have a generating capacity in excess of 100MW, it is considered to be a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008.
- 9.11.5 The Proposed Development would be located within the Order Limits. The Order Limits encompass the total area of the project comprising the Site and Cable Corridors. The Site is specifically the land that is planned to be used for solar PV array and associated infrastructure, BESS, substation, landscaping and habitat enhancement. The Site is split into Whitestone 1 (W1), Whitestone 2 (W2), and Whitestone 3 (W3).
- 9.11.6 Highway Works are sections of the highway network that will contain localised improvements, such as improvements to road edge where it is deteriorated, or temporary highway and traffic works required to safely accommodate the Abnormal Indivisible Load (AIL) deliveries. These areas will support the movement of construction vehicles on narrower sections of the local highway

network within parts of the construction vehicle routes to the Site (as described in **ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]**)

9.11.7 This Appendix is supported by the following figures **[EN0110020/APP/6.19]**:

- **ES Volume 3, Figure 3.1: Order Limits;**
- **ES Volume 3, Figure 3.2: Site Referencing;**
- **ES Volume 3, Figure 3.4: Environmental Designations;**
- **ES Volume 3, Figure 9.10.1: Superficial Geology;**
- **ES Volume 3, Figure 9.10.2: Bedrock Geology;** and
- **ES Volume 3, Figure 9.10.3: Bore Hole Locations.**

9.11.8 This Report covers the associated baseline and risks attributed to historic coal mining activity for W2. W1 and W3, the remaining sections that comprise the Proposed Development will be covered in their own coal mining risk assessments (**ES Volume 3, Appendix 9.10: Coal Mining Risk Assessment: Whitestone 1 [EN0110020/APP/6.20]** and **ES Volume 3, Appendix 9.12: Whitestone 3 [EN0110020/APP/6.20]**).

Whitestone 2

9.11.9 W2 is the name for the central area of solar panels, as shown in **ES Volume 3, Figure 3.2: Site Referencing [EN0110020/APP/6.19]** and is located in the administrative area of RMBC. It comprises approximately 650ha of predominantly agricultural land. W2 is bisected by the M1 and centres around NGR SK 477874.

9.11.10 W2 is bordered by Wickersley to the north, Thurcroft and Dinnington to the east, North Anston to the southeast, Aston and Aughton in the southwest, and Treeton and Brinsworth in the west. The M1 and M18 run north to south through the centre of W2, and the junction between the M1 and the M18 is located to the north of the majority of W2, with the M1 then running west towards Brinsworth to the west of W2. There are six wind turbines associated with Penny Hill Wind Farm in W2, west of the M1, with tip heights of 132m. This wind farm is not connected to the Proposed Development, and appropriate buffers have been given to the turbines within the design of the Proposed Development. Further consideration of this development regarding cumulative impacts are discussed in **ES Volume 2, Chapters 6 to 17 [EN0110020/APP/6.6 – 6.17]**. W2 lies entirely within the Rotherham Green Belt, as discussed in **ES Volume 1, Chapter 4: Alternatives and Design Evolution [EN0110020/APP/6.4]** and **ES Volume 3, Appendix 2.1: Relevant Legislation, Policy, and Guidance [EN0110020/APP/6.20]** and shown in **ES Volume 3, Figure 3.4: Environmental Designations [EN0110020/APP/6.19]**.

9.11.11 W2 has a broad open landscape, with undulations in topography forming bowls and small shallow valleys where there are extensive views, however trees and hedgerows generally contain views from roads and footpaths. The solar arrays will be mounted on frames with foundations extending up to 3m below ground level (BGL). The BESS, Substations and Power Conversion System (PCS) will be mounted on permanent concrete foundations which may extend up to 4m BGL. The cable routes will be installed in temporary trenches, which will be dug to depths of up to 1.2m BGL.

-
- 9.11.12 W2 is shown in **ES Volume 3, Figure 3.2: Site Referencing [EN0110020/APP/6.19]**. As shown on **ES Volume 3, Figure 9.10.4: Bore Hole Locations [EN0110020/APP/6.19]**, the areas of the Proposed Development which have been identified as having the highest potential risks due to historic coal mining activity. This was determined through an assessment of the Mining Remediation Authority Map Viewer and identifying which areas of the Proposed Development overlapped with areas designated as Development High Risk Areas. As such, these are the areas that will be focused on for this risk assessment. These areas of W2 will be henceforth referred to as the Site.
- 9.11.13 Historically this area has been subject to extensive deep coal mining activities. The Treeton, Brookhouse and Orgreave Collieries have been identified as having worked coal seams beneath W2.
- 9.11.14 This Report uses available, identified data to review the potential coal mining risks that may be associated with future redevelopment and also determine if an intrusive investigation is warranted.

Environmental Site Setting

- 9.11.15 ERM has completed an assessment of the environmental setting of the Site (geology, hydrogeology, hydrology, and surrounding land uses including sensitive receptors). A summary of the current setting is presented below.

Geology

- 9.11.16 Much of the Site is not underlain by any superficial deposits. The eastern and western sections do not have any superficial deposits, while the southern section is partially underlain by Alluvium of gravel, sand, silt and clay.
- 9.11.17 Areas of the southern section, and the eastern section are recorded by British Geological Society (BGS) Geoindex² as Artificial Ground.
- 9.11.18 The solid (bedrock) geology consists varying narrow bands of the Pennine Middle Coal Measures of mudstone, siltstone and sandstone. In the southern sections there are sandstone members of Mexborough Rock and in the west and eastern sections, sandstone members of Ackworth Rock.
- 9.11.19 According to the Coal Mining Consultants Report (Annex A), there are multiple geological faults present within the Site. The southern, western and eastern sections all have separate geological faults bisecting them in a northwest-southeast direction.
- 9.11.20 There are many BGS recorded located around the Site. Many of these boreholes are found within the close vicinity of the M1. Borehole ref. SK48NW342 located north of the southern section shows a lithology of interbedded and weathered siltstones, sandstones and clays in first 10m BGL, followed by organic-rich mudstone and thinly laminated siltstones and sandstones up to a termination depth of 30m BGL. Possible mine workings were identified at 18 – 20.5m BGL. Borehole ref. SK48NW342, north of the eastern section identifies three coal seams, Meltonfield, Two Foot and High Hazel at depths of 6.5, 19.5 and 61.5m BGL respectively. The superficial and bedrock geology are shown on **ES Volume 3, Figure 9.10.1: Superficial Geology [EN0110020/APP/6.19]** and **ES Volume 3, Figure 9.10.2: Bedrock Geology [EN0110020/APP/6.19]**, respectively.

Hydrogeology

- 9.11.21 The alluvium superficial deposits underlying the southern section of the Site are categorised as a Secondary A aquifer, while the head superficial deposits underlying the western section of the Site are categorised as a secondary undifferentiated aquifer. The coal measures bedrock underlying the Site is classed as a Secondary A aquifer.

Hydrology

- 9.11.22 Ulley Brook is present on the Site (southern section) flowing in a north-south direction. According to the Environment Agency, Ulley Brook has good ecological status. There are two further unnamed streams/rivers located in the western and eastern sections but with no details as to their ecological or chemical status.

Other Sensitive Land Uses

- 9.11.23 There are no Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC) or Special Protection Areas (SPAs) within 1km of the Site.
- 9.11.24 The nearest Ancient Woodlands are Revel Wood, adjacent to the western section, and Burnt Wood, adjacent to the southern section.

Vulnerability and Sensitivity

- 9.11.25 ERM considers the groundwater vulnerability to be moderate due to predominantly low permeability geology. ERM considers the groundwater sensitivity to be moderate due to the Secondary A aquifer bedrock.
- 9.11.26 ERM considers the surface water vulnerability to be moderate due to the closest water feature being located on Site. ERM considers the surface water sensitivity to be moderate-high based on good ecological and chemical status of Ulley Brook.

Coal Authority Report Review – South

- 9.11.27 ERM have reviewed the Coal Authority Report (380830685_1, dated 7 July 2025) for the Site which is summarised below. The Coal Authority Report is shown in Annex A.

Past Underground Coal Mining

- 9.11.28 Past underground coal mining is considered a Low risk to the southern section of W2.
- 9.11.29 The southern section of W2 is in an area that could be affected by underground mining in eight seams of coal from 188m to 670m depth and last worked in 1982.
- 9.11.30 The seams are not likely within influencing depth of the surface and if movement in the ground had occurred due to coal mining activity associated with these workings, this should have ceased by now. All ground disturbance associated with the Proposed Development will only be up to a depth of 4m BGL which is not in influencing depth of past underground workings.
- 9.11.31 In addition, the southern section of W2 is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past.
- 9.11.32 The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk. This is further considered later in the risk assessment.

Present Underground Coal Mining

- 9.11.33 Present underground coal mining is considered a Low risk to the southern section of W2.
- 9.11.34 The southern section of W2 is not within an area that could be affected by present underground mining.
- 9.11.35 The southern section of W2 is not in an area where the Coal Authority has received an application for or is currently considering whether to grant a licence to remove or work coal by underground methods.
- 9.11.36 The southern section of W2 is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.
- 9.11.37 The southern section of W2 is not in an area likely to be affected from any planned future underground coal mining. However, reserves of coal exist in the local area which could be worked at some time in the future.

Future Underground Coal Mining

- 9.11.38 Future underground coal mining is considered a Low risk to the southern section of W2.
- 9.11.39 The southern section of W2 is not in an area where the Coal Authority has received an application for a coal mining license.

Mine Entries

- 9.11.40 Mine entries are considered a Low risk to the southern section of W2.
- 9.11.41 There are no recorded mine entries within 100m of W2.

Coal Mining Geology

- 9.11.42 Coal mining geology is considered a Low risk to the southern section of W2.
- 9.11.43 The Coal Authority are not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

Past, Present and Future Opencast Coal Mining

- 9.11.44 Past, present and future opencast coal mining is considered a Medium risk to the southern section of W2.
- 9.11.45 The majority of the Site, especially in the north, are recorded as being Unlicensed Opencast Sites. Brecks and Shafton outcrops are both present within W2 and are located through the centre in a northwest-southeast direction. The opencast site mirrors the BGS Geoindex records for artificial, infilled land. This information suggests that the Brecks and Shafton outcrops were likely worked for opencast coal and subsequently infilled with mine spoil or other unknown material.
- 9.11.46 Outside of the Site boundaries, there are further Unlicensed Opencast Sites adjacent to the north.
- 9.11.47 There are no recorded licensed opencast sites within 500m of the Site.

Coal Mining Subsidence

- 9.11.48 Coal mining subsidence is considered a Low risk to the southern section of W2.
- 9.11.49 There is no record of coal mining subsidence for the southern section of W2, or within 50m since 1994.
- 9.11.50 There are no current Stop Notices delaying the start of remedial works or repairs to the southern section of W2.
- 9.11.51 The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine Gas

- 9.11.52 Mine gas is considered a Low risk to the southern section of W2.
- 9.11.53 No mine gas incidents have been recorded within 500m of the Site. The Coal Authority states that this does not necessarily mean that no mine gas is present within the vicinity of the Site and that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases.

Hazard Related to Coal Mining

- 9.11.54 Hazard related to coal mining is considered a Low risk to the southern section of W2.
- 9.11.55 The southern section of W2 has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.
- 9.11.56 There have been no site investigations or remediated sites within 50m of the Site.

Mine Water Treatment Schemes

- 9.11.57 Mine water treatment schemes are considered a Low risk to the southern section of W2.
- 9.11.58 The Coal Authority has no record of Mine Water Treatment Schemes within 500m of W2.

Coal Authority Managed Tips

- 9.11.59 Coal Authority managed tips are considered a Low risk to the southern section of W2.
- 9.11.60 As detailed in the Coal Authority Report, there are no Coal Authority Managed Tips within 500m of W2.

Coal Authority Report Review – West

- 9.11.61 ERM have reviewed the Coal Authority Report (380831315_1, dated 7 July 2025) for the Site which is summarised below. The Coal Authority Report is shown in Annex A.

Past Underground Coal Mining

- 9.11.62 Past underground coal mining is considered a Low risk to the western section of W2.
- 9.11.63 The western section of W2 is in an area that could be affected by underground mining. There is one recorded coal seam beneath the Site (Treeton Top Hard) at a depth of 398m BGL and it was last worked in 1938.
- 9.11.64 The seam is not likely within influencing depth of the surface and if movement in the ground had occurred due to coal mining activity associated with these workings, this should have ceased by now.
- 9.11.65 In addition, the southern section of W2 is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past.
- 9.11.66 The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk.

Present Underground Coal Mining

- 9.11.67 Present underground coal mining is considered a Low risk to the western section of W2.
- 9.11.68 The western section of W2 is not within an area that could be affected by present underground mining.
- 9.11.69 The western section of W2 is not in an area where the Coal Authority has received an application for or is currently considering whether to grant a licence to remove or work coal by underground methods.
- 9.11.70 The western section of W2 is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.
- 9.11.71 The western section of W2 is not in an area likely to be affected from any planned future underground coal mining. However, reserves of coal exist in the local area which could be worked at some time in the future.

Future Underground Coal Mining

- 9.11.72 Future underground coal mining is considered a Low risk to the western section of W2.
- 9.11.73 Not in an area where the Coal Authority has received an application for a coal mining license.

Mine Entries

- 9.11.74 Mine entries are considered a Low risk to the western section of W2.
- 9.11.75 There are no recorded mine entries within 100m of W2.

Coal Mining Geology

- 9.11.76 Coal mining geology is considered a Low risk to the western section of W2.
- 9.11.77 The Coal Authority are not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

Past, Present and Future Opencast Coal Mining

- 9.11.78 Past, present and future opencast coal mining is considered a Medium risk to the western section of W2.
- 9.11.79 The Coal Authority report indicates that there are several records of Unlicensed Opencast Sites covering the vast majority of the western section of W2. The Brecks coal outcrop is present within the Site boundaries and is in a similar location to the Unlicensed Opencast Sites, running in a west-east direction. A further conjectured outcrop (Shafton) is located 20m north of the Site.
- 9.11.80 There are further Unlicensed Opencast Sites adjacent to the north and south of the Site.
- 9.11.81 There are no opencast licensed areas within W2.

Coal Mining Subsidence

- 9.11.82 Coal mining subsidence is considered a Low risk to the western section of W2.
- 9.11.83 There is no record of coal mining subsidence for the western section of W2, or within 50m since 1994.
- 9.11.84 There are no current Stop Notices delaying the start of remedial works or repairs to the western section of W2.
- 9.11.85 The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine Gas

- 9.11.86 Mine gas is considered a Low risk to the western section of W2.
- 9.11.87 No mine gas incidents have been recorded within 500m of the Site. The Coal Authority states that this does not necessarily mean that no mine gas is present within the vicinity of the Site and that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases.

Hazard Related to Coal Mining

- 9.11.88 Hazard related to coal mining is considered a Low risk to the western section of W2.
- 9.11.89 The western section of W2 has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.
- 9.11.90 There have been no site investigations or remediated sites within 50m of the Site.

Mine Water Treatment Schemes

- 9.11.91 Mine water treatment schemes is considered a Low risk to the western section of W2.
- 9.11.92 The Coal Authority has no record of Mine Water Treatment Schemes within 500m of W2.

Coal Authority Managed Tips

- 9.11.93 Coal Authority managed tips are considered a Low risk to the western section of W2.
- 9.11.94 The Coal Authority report that there are no Coal Authority Managed Tips within 500m of W2.

Coal Authority Report Review – East

- 9.11.95 ERM have reviewed the Coal Authority Report (380831315_1 and 380830980_1, dated 7 July 2025) for the Site which is summarised below. The Coal Authority Report is shown in Annex A.

Past Underground Coal Mining

- 9.11.96 Past underground coal mining is considered a Low risk to the eastern section of W2.
- 9.11.97 The eastern section of W2 is in an area that could be affected by underground mining in four seams of coal from 420m to 708m depth and last worked in 1990.
- 9.11.98 The seams are not likely within influencing depth of the surface and if movement in the ground had occurred due to coal mining activity associated with these workings, this should have ceased by now.
- 9.11.99 In addition, the eastern section of W2 is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past.
- 9.11.100 The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk.

Present Underground Coal Mining

- 9.11.101 Present underground coal mining is considered a Low risk to the eastern section of W2.
- 9.11.102 The eastern section of W2 is not within an area that could be affected by present underground mining.
- 9.11.103 The eastern section of W2 is not in an area where the Coal Authority has received an application for or is currently considering whether to grant a licence to remove or work coal by underground methods.
- 9.11.104 The eastern section of W2 is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.
- 9.11.105 The eastern section of W2 is not in an area likely to be affected from any planned future underground coal mining. However, reserves of coal exist in the local area which could be worked at some time in the future.

Future Underground Coal Mining

- 9.11.106 Future underground coal mining is considered a Low risk to the eastern section of W2.
- 9.11.107 Not in an area where the Coal Authority has received an application for a coal mining license.

Mine Entries

- 9.11.108 Mine entries are considered a Low risk to the eastern section of W2.
- 9.11.109 There are no recorded mine entries within 100m of W2.

Coal Mining Geology

- 9.11.110 Coal mining geology is considered a Low risk to the eastern section of W2.
- 9.11.111 The Coal Authority are not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

Past, Present and Future Opencast Coal Mining

- 9.11.112 Past, present and future opencast coal mining is considered a Medium risk to the eastern section of W2.
- 9.11.113 The majority of the centre of the Site, north of the M1, is identified as several Unlicensed Opencast Sites. The Brecks and Shafton coal outcrops are both identified within W2, with a further unnamed inferred outcrop to the south of the M1. The opencast sites mirror the BGS Geoindex records for artificial, infilled land. This information suggests that the Breck and Shafton outcrops were likely worked for opencast coal and subsequently infilled with mine spoil or other unknown material.
- 9.11.114 There are further unlicensed opencast mines identified approximately 400m to the north of the Site
- 9.11.115 There are no licensed opencast areas within W2.

Coal Mining Subsidence

- 9.11.116 Coal mining subsidence is considered a Low risk to the eastern section of W2.
- 9.11.117 There are no claims within 50m of W2 for coal mining subsidence.
- 9.11.118 There are no current Stop Notices delaying the start of remedial works or repairs to W2.
- 9.11.119 The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine Gas

- 9.11.120 Mine gas is considered a Low risk to the eastern section of W2.
- 9.11.121 There are no records of mine gas incidents within 500m of W2. The Coal Authority states that this does not necessarily mean that no mine gas is present within the vicinity of the Site and that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases.

Hazard Related to Coal Mining

- 9.11.122 Hazard related to coal mining is considered a Low risk to the eastern section of W2.
- 9.11.123 The eastern section of W2 has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures. One record of a site investigation is identified ~30m southwest of W2, however there is no further information available regarding its purpose or findings.

Mine Water Treatment Schemes

- 9.11.124 Mine water treatment schemes are considered a Low risk to the eastern section of W2,

9.11.125 The Coal Authority has no record of Mine Water Treatment Schemes within 500m of W2.

Coal Authority Managed Tips

9.11.126 Coal Authority managed tips are considered a Low risk to the eastern section of W2.

9.11.127 The Coal Authority report that there are no Coal Authority Managed Tips within 500m of W2.

Shallow Coal Mining Risk Assessment

9.11.128 Based on review of the Coal Authority Report, there is one main identified risk from past coal mining activities to the development across all three sections of the Site.

9.11.129 This relates to the areas of unlicensed opencast mining within the Site. These are significant across all three sections and generally correspond to the two identified shallow coal outcrops, Brecks and Shafton, and a third unnamed conjectured outcrop. These unlicensed opencast areas also correspond to areas of infilled made ground according to the BGS Geoviewer in the southern and eastern sections. The nature and extent of the backfilled material is currently unknown and could pose both a contamination and subsidence risk. As such the risk from opencast mining is considered to be medium.

9.11.130 These shallow opencast mining areas and the coal outcrops are likely the driving reason behind why the Coal Authority considers these areas as a high risk to development.

Conclusions

9.11.131 With regards to the development area, a review of available Coal Authority and BGS data has established the following risk ratings:

9.11.132 ERM has not identified any significant risk to the development from past, current or future deep coal mining activities. Although there has been extensive underground coal mining beneath the Site, the last recorded activities occurred in 1990 with the shallowest seam worked at 188m BGL. It is likely that at this depth, there is little influencing of the surface and if movement in the ground had occurred due to coal mining activity associated with these workings, it should have ceased by now.

9.11.133 No mine entries were identified within the boundaries of W2, which also compounds on the low-risk from underground mining as no consideration is needed into their treatment and condition.

9.11.134 ERM considers there to be a medium-high risk that shallow coal workings have occurred within W2. A review of Coal Authority and BGS data indicates the presence of shallow coal outcrops which were likely worked from opencast mines and subsequently infilled with mine spoil and other unknown material. BGS borehole logs identified coal measures and likely mine workings at approximately 6 - 18m BGL at the shallowest depths. ERM recommends that below ground installations, including foundations for solar panels and other permanent infrastructure, is avoided in the areas of identified shallow coal

workings. If this cannot be avoided, then further Phase 2 investigations to establish the geotechnical risk, or other mitigation will be required.

- 9.11.135 If, during construction, disturbed ground or voids are identified it is expected that this could be managed during the construction in accordance with Coal Authority requirements. With the condition of the infilled land unknown, potential contamination could have the possibility of being migrated during construction activities.
- 9.11.136 ERM recommends a site walkover and likely Phase 2 geotechnical assessment to assess the status of the infilled land due to shallow and opencast coal mining activities within W2.



WHITESTONE
solar farm

Contact

Whitestone Net Zero Ltd

info@whitestonesolarfarm.co.uk

0800 688 9936