



Environmental Statement - Volume 4

(Non-Technical
Summary)

**Scout Moor II
Further Environmental Information**

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Client

Cubico UK Development (Wind 1) Limited

July 2026

1. Introduction

Overview

- 1.1 In 2025, Cubico UK Developments (Wind 1) Limited (the ‘Applicant’) submitted concurrent full planning applications to Rochdale Metropolitan Borough Council (RMBC) (Ref: 25/00680/FUL) and Rossendale Borough Council (RBC) (Ref: 2025/0267) (the ‘Applications’) as the Local Planning Authorities (LPAs) for the construction and operation of a wind farm of up to 17 turbines, up to 180m in height with a generating capacity of up to 99.9MW supported by an Environmental Statement (ES) (‘2025 ES’).
- 1.2 Since submission of the Applications and the 2025 ES, the design has evolved in response to technical and environmental constraints as well as taking into consideration consultation comments raised since submission. The Applicant has therefore submitted revised concurrent full applications supported by a revised ES (Further Environmental Information (FEI)) for the construction and operation of a wind farm of up to 12 wind turbines, up to 180m in height, with a generating capacity of 68.4MW. It also includes the required access tracks and electrical infrastructure required to connect the wind farm to the local distribution network via the Rossendale Bulk Supply Point. The Applications also include proposals to restore and enhance an extensive area of severely degraded peat moorland as part of a Moorland Restoration and Management Plan. Collectively these components are referred to as the ‘Project for Assessment’ within the ES.

- 1.3 The applications have been submitted to both LPAs as the project lies partially within both council areas.

What is Environmental Impact Assessment?

- 1.4 As part of the planning process, an Environmental Impact Assessment (EIA) has been undertaken. This is a systematic process to identify, assess and report the likely significant environmental effects on the surrounding environment and residents during construction, operation and decommissioning. Measures to avoid, reduce or manage these effects are then developed. It is a legal requirement for an EIA to be undertaken for development projects that are likely to cause significant environmental effects.
- 1.5 The aim of EIA is to protect the environment by ensuring that when deciding whether to grant planning permission for a project, the local authority does so in the full knowledge of the likely significant environmental effects of the project and takes them into account in the decision-making process.

What is an Environmental Statement?

- 1.6 An Environmental Statement (ES) reports the outputs of an EIA process to inform decision-making on a planning application.
- 1.7 This ES comprises four Volumes:
- **Volume 1: Primary Report and Supporting Graphics;**
 - **Volume 2: Technical Appendices to the Primary Report;**
 - **Volume 3: Environmental Management Plan; and**

- **Volume 4: Non-Technical Summary.**

1.8 The contents of this ES are in line with the requirements set out within The Town and Country Planning (Environmental Impact Assessment) Regulations 2027 (the ‘EIA Regulations’)¹.

What is a Non-Technical Summary?

1.9 The EIA Regulations require an ES to include a non-technical summary (NTS) of the information presented within the ES.

1.10 This NTS provides the summary of the EIA process and outputs of assessments, specifically covering the following key aspects:

- An overview of the location of the Project for Assessment and a description of the Project for Assessment and what it includes (**Section 2**);
- An outline of the EIA process undertaken (**Section 3**);
- A summary of the environmental baseline conditions of the area (**Section 4**);
- A summary of the outputs of the technical assessments undertaken as part of the EIA process (**Section 5**); and
- A summary of the evaluation of ‘cumulative effects’ of the project and with other projects (**Section 6**).

¹ The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 no. 571 (as amended).

Contact Detail

Rochdale Metropolitan Borough Council

Planning and Development, Number One Riverside, Smith Street, Rochdale, OL16 1XU. Use Ref: 25/00680/FUL at:

<https://publicaccess.rochdale.gov.uk/online-applications/>

Rossendale Borough Council

The Business Centre, Futures Park, Bacup, OL13 0BB. Use Ref: 2025/0267 at:

<https://publicaccess.rossendale.gov.uk/online-applications/>

Cubico project website

<https://www.scoutmoor2.co.uk/>

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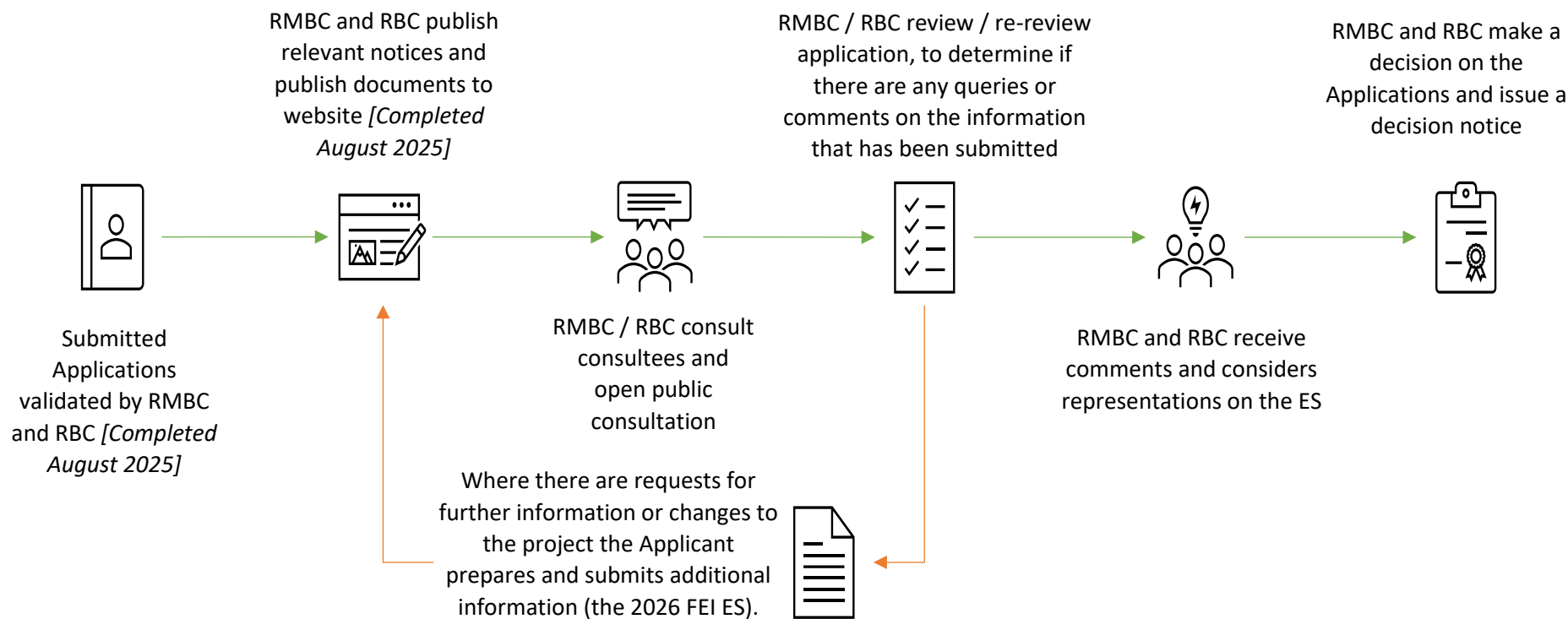
Tel: 0161 233 7676

What happens next?

1.11 The Applications were originally validated by RMBC and RBC in August 2025 and have been subject to an extended period of statutory consultation, in line with the general process outlined within **Extract 1** overleaf. Following the submission of FEI, RMBC

and RBC will undertake further consultation for a period not less than 30 days (or other timescale as may be agreed between RMBC, RBC and the Applicant in writing). Once they have completed consultation and undertaken their independent assessment of the Applications, RBC and RMBC will proceed to determine the Applications.

- 1.12 The ES is available on the RMBC and RBC planning portal websites and members of the public and other consultees have an opportunity to comment on the Application via the RMBC and RBC planning portal websites – see the box above. The Cubico project website address is also in the box above. Electronic copies of the ES can be requested from Turley at a fee of £15 (digital file) using the contact details within the box above.

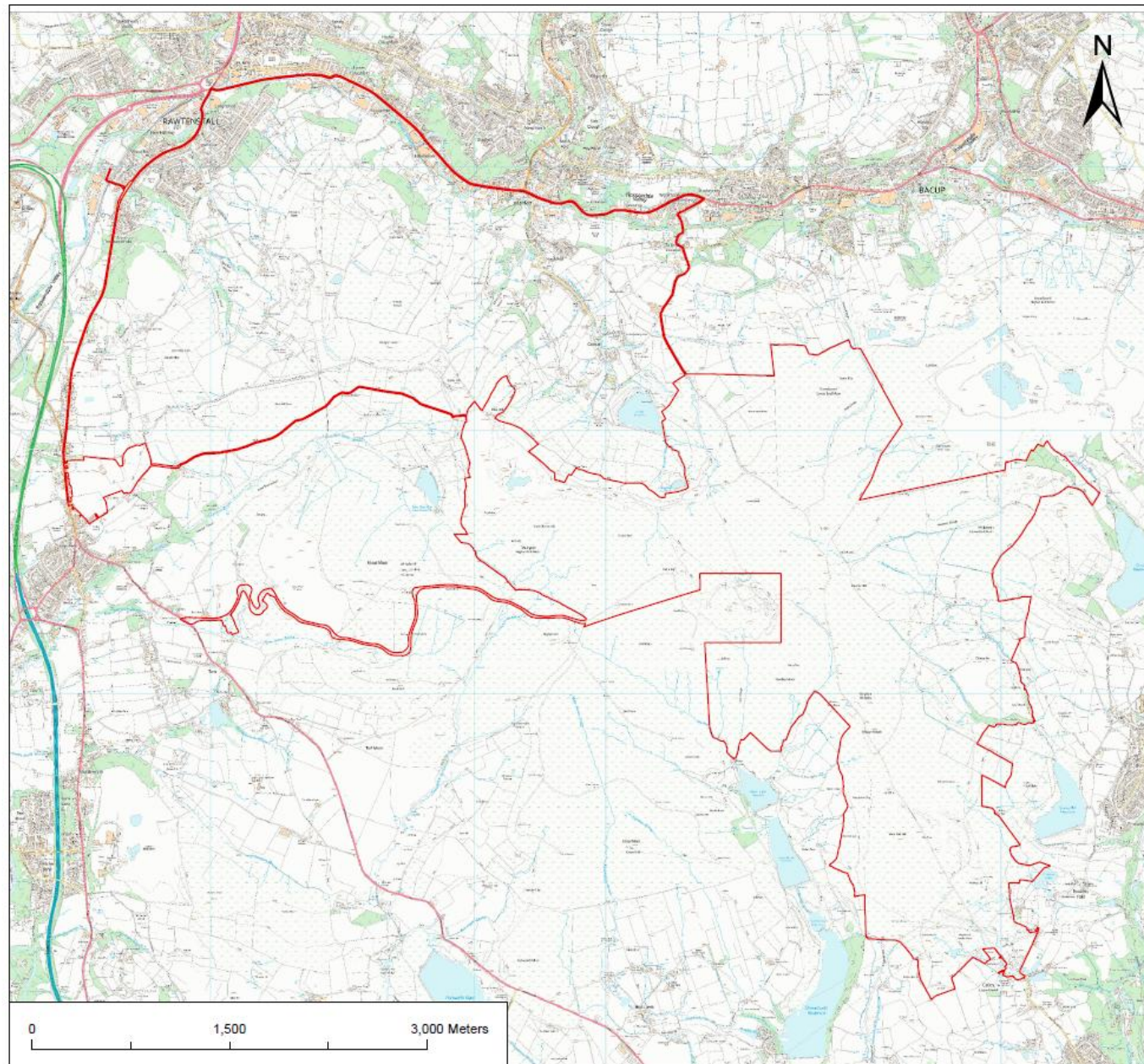


Extract 1: Overview of the planning determination process

2. The Project for Assessment

Where is the Project for Assessment located?

- 2.1 The area for the Project for Assessment covers approximately 1,024 hectares and is termed the 'Assessment Boundary'. A plan showing its extent is provided in **Extract 2**.
- 2.2 The Assessment Boundary predominantly includes an area of open moorland, including Rooley Moor, Scout Moor, Cowpe Moss and Brandwood Moor that collectively form part of the Southern Pennines. It contains areas of blanket bog, upland flushes, fens and swamps, upland heathland alongside grassland, bracken, standing water, watercourses (ditches, drains and brooks), scree, hardstanding and woodland. The spurs to the north and west follow existing roads and therefore include areas of hardstanding.
- 2.3 Parts of the Assessment Boundary comprise Common Land, primarily used for the grazing of sheep and cattle alongside public access. There are also areas of Open Access Land. Section 6 (Summit to Lumb) of the Pennine Bridleway, utilised by walkers and horse riders, runs through the central section of the Assessment Boundary (along the alignment of Rooley Moor Road) and is part of a larger 330km recreational trail running through North West England. This includes parts of the Mary Towneley Loop. There is also the Rossendale Way, which traverses the western and northern boundaries of the Assessment Boundary, and the Rochdale Way, which traverses its south-western edge. There are a number of other informal / permissive paths across the moorland.
- 2.4 There are a series of reservoirs to the east, south and west, including Cowpe Reservoir, Spring Mill Reservoir, Naden Upper Reservoir and Scout Moor High Level Reservoir. The River Irwell lies to the north and west with the River Spoden lying to the east.
- 2.5 There are no residential properties located within the Assessment Boundary. However, there are dispersed farmsteads across the moorland, and a number of existing properties are located along Rooley Moor Road to the south as well as a cluster of properties situated to the north in the hamlet of Cowpe. Residential properties are also located within Stacksteads, Newchurch, Rawtenstall and Bacup to the north, Whitworth, Facit, Millgate and Shawforth to the east and Edenfield and Ramsbottom to the west. More widely, Blackburn lies to the north-west, Halifax lies to the east, Rochdale, Heywood and Bury lie to the south and Bolton lies to the west.
- 2.6 Scout Moor Wind Farm is partially situated in the western part of / adjacent to the Assessment Boundary. There are a number of other wind turbines / wind farms in the surrounding area, including at Sheepfold to the north, Crook Hill to the east and at Hyndburn to the west.
- 2.7 Parts of the Assessment Boundary are designated as Green Belt (as part of the Liverpool, Manchester and West Yorkshire Green Belt).



Extract 2: Assessment Boundary



Extract 3: Views in the western part of the Assessment Boundary



Extract 4: Views from the south-western part of the Assessment Boundary



Extract 5: Views adjacent to the western boundary of the Assessment Boundary near Ding Quarry



Extract 6: Views from the south-eastern part of the Assessment Boundary

What will construction involve?

2.8 The main construction activities on-site will include:

- Site securement, around construction working areas;
- Enabling works and establishment of temporary construction laydown area off Scout Road and the construction compound;
- Localised site clearance and implementation of protective measures around features to be retained;
- Ground investigations with remedial works (if required);
- Appropriate storage / translocation of peat to suitable receptor sites;
- Formation of drainage features and creation of outfall(s);
- Earthworks and creation of site access tracks, turbine foundations and crane pads;
- Wind turbine erection;
- Installation of electrical connections and construction of substation control building alongside other electrical infrastructure;
- Turbine commissioning and testing;

- Decommissioning of construction compound, and site reinstatement; and
- Landscaping, habitat management and peatland enhancement works.

How long will it take to build?

2.9 The main construction programme will be circa 2 years. The wind farm will have an operational life of 40 years and will be decommissioned in 2070.

What about the Common Land?

2.10 Where required to deliver the Project for Assessment, land will be deregistered under the relevant statutory provisions, and suitable replacement land will be provided to compensate for the areas released from the Common Land.

2.11 New fencing will be installed and existing fencing will be repaired / upgraded to stockproof fencing. Access points will also be installed where appropriate, including field gates, reinforced vehicle barriers, kissing gates and stiles.

What will happen to public access during construction?

2.12 Health, safety and security requirements will make it necessary to manage the use of routes where they cross or are near the construction working areas and the site access tracks.

2.13 This will include short-term path closures during specific construction activities as well as the provision of temporary diversions, where required. Clearly marked crossing points with

appropriate signage will also be implemented as part of a Path Management Plan.

- 2.14 As part of the Project for Assessment works will also be undertaken to enhance public access, including opening 10.3km of site tracks to walkers, cyclists and horse riders (following completion of works), the establishment of a new link from Rooley Moor Road to avoid a section with a steep incline, strengthening the connection between Lee Quarry and Cragg Quarry mountain bike facilities via access tracks, upgrading infrastructure and providing information panels / boards at key locations to highlight historic features, water supply infrastructure and renewable energy.

What about illegal activity on the moorland?

- 2.15 As part of the coordinated package of measures to reduce illegal off-road vehicle use, barriers will be installed to prevent access, including fencing, bunds, strategic planting and controlled access points to deter illegal vehicles while maintaining access for walkers, cyclists and horse riders.

What do the moorland restoration works include?

- 2.16 As part of the Project for Assessment, moorland restoration is proposed to enhance the existing habitats and increase carbon sequestration (i.e. taking carbon out of the atmosphere) / climate resilience (i.e. to respond to and recover from the impacts of climate change), alongside providing improvements in water quality and reducing flood risk.
- 2.17 There is a commitment to the following outcomes:

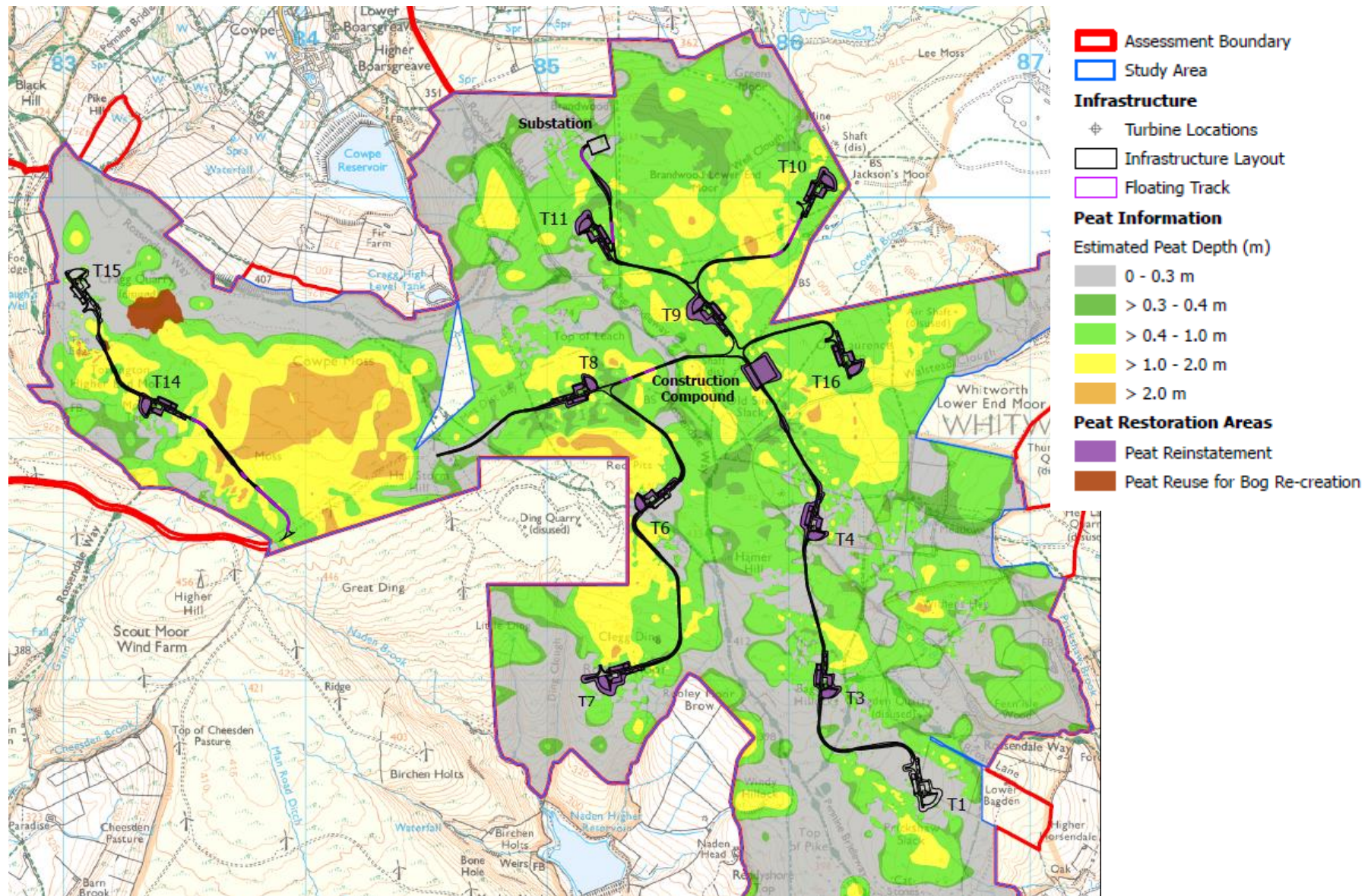
- Peat balance: Ensure no net loss of peat material;
- Peat restoration: Restore areas of bare, eroding peat; and
- Habitat condition improvement: Where feasible, upgrade 'poor' condition blanket bog to 'moderate' condition.

- 2.18 A Moorland Restoration and Management Plan has been developed using the most recent guidance. All peatland habitats lost to the Project for Assessment will be restored at a ratio of 1:10 (i.e. for every 1ha of peatland habitat loss, 10ha of additional degraded habitat will be restored). The restoration works will comprise installing fencing and controlling numbers of grazing animals, creating bogs, planting and vegetation management.

- 2.19 The delivery of the plan will be controlled via a legal agreement as part of any planning permission (called a Section 106 obligation).

What will happen to the peat on-site?

- 2.20 During and after excavation, the storage, haulage and re-use of excavated peat will be planned to minimise movement. Best practice measures for temporary and permanent peat storage during construction will be followed, in accordance with relevant guidance. Any excavated peat will then be re-used in site reinstatement or placed in the north-western part of the Assessment Boundary to reconnect isolated peat deposits. See **Extract 7**. As noted above, additional restoration methods are proposed in areas of degraded peat.



Extract 7: Peat reinstatement and peat reuse for bog re-creation

Are other habitat enhancements proposed?

- 2.21 The following habitats will be enhanced / created:
- Acid grassland;
 - Woodland; and
 - Tree planting within marginal riparian habitat.
- 2.22 Bird and bat boxes will also be installed alongside hibernacula for reptiles and amphibians.

What route will construction vehicles take?

- 2.23 Very large components (e.g. the wind turbines) are anticipated to arrive at the Port of Liverpool and then access travel from the north via the M65, A56, A680, B6527 and A680.
- 2.24 Construction access will be via Scout Road (i.e. the existing Scout Moor Quarry access from the A680). The vehicles will use the existing and new cut / floating tracks. No construction vehicles will go up / down Rooley Moor Road.

What are the proposed construction working hours and days?

- 2.25 Unless otherwise agreed with RBC / RMBC, construction working hours will be 08:00 to 18:00 Monday to Friday and 09:00 to 14:00 Saturday, with no working on Sundays or Public / Bank Holidays. Exceptions may arise (e.g. when very large components are delivered), and appropriate permissions and notifications will be sought. Some quiet works may take place outside of these hours.

Will environmental management measures be put in place during construction?

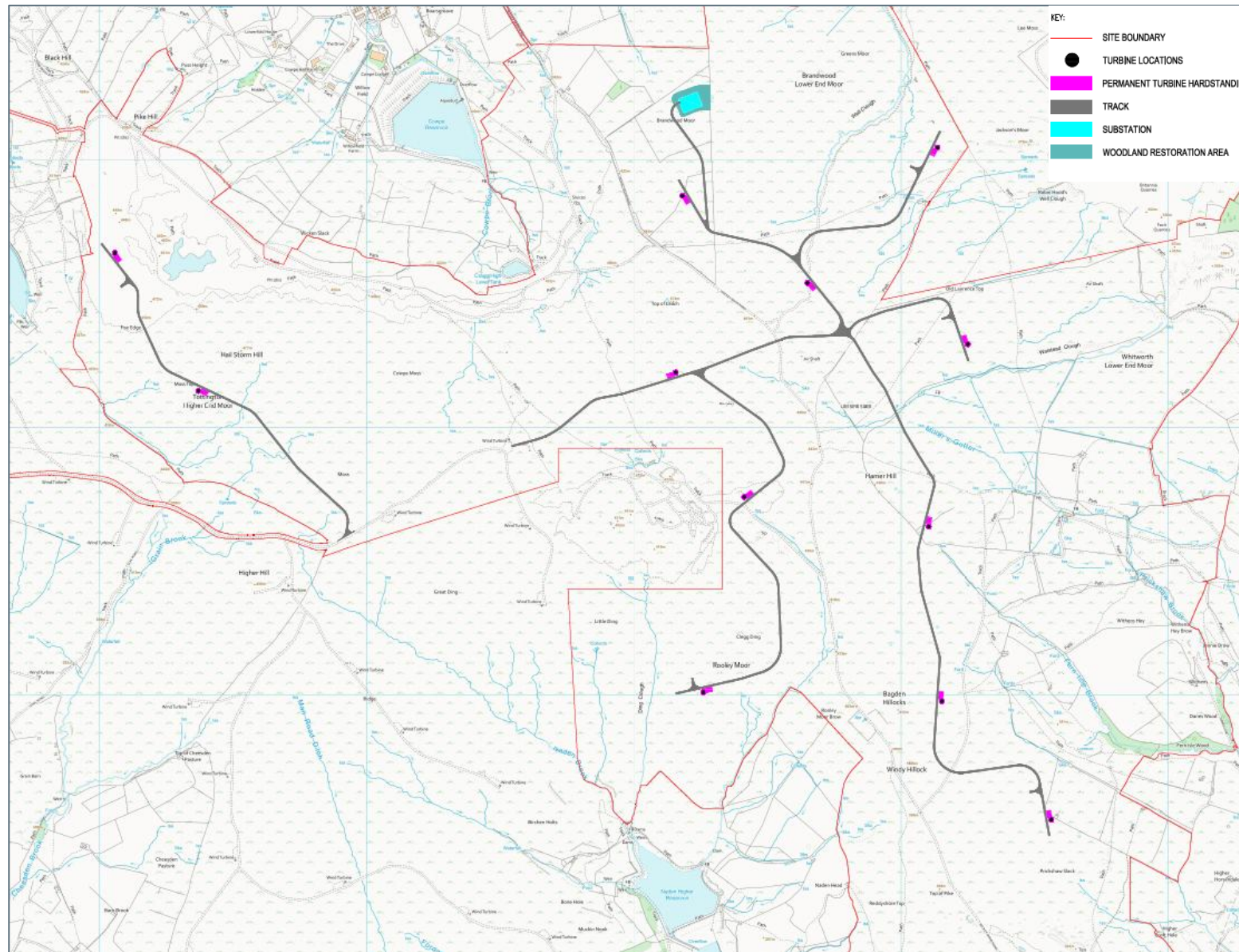
- 2.26 Yes. The appointed contractors will comply with current health and safety legislation (e.g. Construction (Design and Management) Regulations 2015).
- 2.27 The required measures to reduce impacts on the environment will be captured within a Construction Environmental Management Plan (CEMP) as well as contract documents, methods statement and risk assessments issued by the appointed contractors ahead of the works.

How many wind turbines are proposed and how big will they be?

- 2.28 The wind farm will consist of up to 12 turbines with a total generation capacity of up to 68.4MW. The maximum height of the wind turbine will be up to 180m, to tip height. Visuals are provided in **Volume 1** which show what the wind turbines will look like from a number of selected viewpoints.

What else will be on-site during operation?

- 2.29 In addition to the wind turbines, the other operational infrastructure includes a substation, including a control building up to 6.7m high, parking and electrical infrastructure, site access tracks, retained for operational maintenance activities and public access and parts of the turbine crane pads / hardstanding for maintenance activities. The operational layout plan is shown in **Extract 8**.



Extract 8: Operational stage site layout

Will moorland and habitat management continue?

- 2.30 Yes. Moorland and habitat management, monitoring and maintenance will continue during the operational stage in relation to peat habitat, grassland, birds and other species enhancements.

What is likely to be involved in decommissioning?

- 2.31 Decommissioning works are anticipated to include dismantling and removal of wind turbines, substation control building and electrical infrastructure alongside removal of concrete bases / foundations up to 1.5m below ground level and cover with topsoil.
- 2.32 Where features are removed, the land will be reinstated to its original baseline conditions in so far as is possible. The screening woodland can also be left in-situ or removed if preferred.

What alternatives have been considered?

- 2.33 The EIA Regulations state that a “*description of the reasonable alternatives studies by the developer*” should be provided. The following types of alternatives have been considered: alternative sites, technologies, ‘do nothing’ scenario and technologies.

Alternative sites

- 2.34 Whilst alternative ‘sites’ have not been compared, a three-stage screening process has been used to identify an area of land appropriate for a commercial-scale wind scheme.
- **Stage 1: Viability** – areas with appropriate wind speeds to generate suitable energy yield were identified. These areas

were then screened against a series of logistical and economic factors, including the proximity to a grid connection point and areas in military land use or in airfield buffers or other aviation constraints;

- **Stage 2: Environmental designations** – statutory and non-statutory environmental constraints and associated zone of influence are applied to the viable areas which further reduces the land areas available for commercial wind development. Although this process does not negate the occurrence of likely significant effects of a potential project, it is considered an essential step to exclude the areas of greatest sensitivity; and
- **Stage 3: Land / legal agreements** – the ability to proceed with the planning application process at a site is dependent on various land agreements and legalities, the success of which is highly dependent on specific site circumstances.

- 2.35 Through the above, the Applicant determined the Assessment Boundary to be an appropriate location for a commercial onshore wind development and subsequently progressed with the development of the Applications.

Alternative technologies

- 2.36 Alternative technologies (e.g. other renewable technologies or other forms of wind energy generation equipment) were not considered. This is because the moorland on which the Assessment Boundary is located is an optimal choice for wind

energy generation due to being an open elevated landscape with minimal obstructions and no other forms of wind generation equipment were considered to be as efficient and maximise energy generation.

Alternative designs

2.37 The design of the Project for Assessment has evolved in response to studies, surveys and modelling to take account of the environmental constraints and opportunities. In addition, consultation with stakeholders have also informed the design development process. The following design alternatives were considered:

- **Turbine layouts** – in total five layouts were considered, ranging from 24 turbines to the 12 turbine submission layout. If the other layouts were taken forward there would likely be less favourable effects reported in relation to transport and access, noise and vibration, ecology, landscape and visual, built heritage, and hydrology, hydrogeology and peat;
- **Micrositing influences on layout** – this has involved moving wind turbines out of areas of deeper peat, archaeological potential, identified mining risk areas and away from properties to reduce noise and visual effects;
- **Turbine height** – increasing the tip height to 180m allowed for efficiency by accessing stronger and more consistent wind flows; and

- **Access and infrastructure** – alternative access was considered from the south as well as the use of the existing Scout Moor Quarry access. The latter has lesser impacts in relation to the removal of peatland and habitats, risk of archaeological disturbance, visual effects, transport movements and greenhouse gas emissions. Once the turbine locations were fixed in the final layout, internal access tracks were routed in the most efficient manner to reduce the length of the tracks and avoid steep slopes whilst reducing environmental impacts.

‘Do Nothing’ Scenario

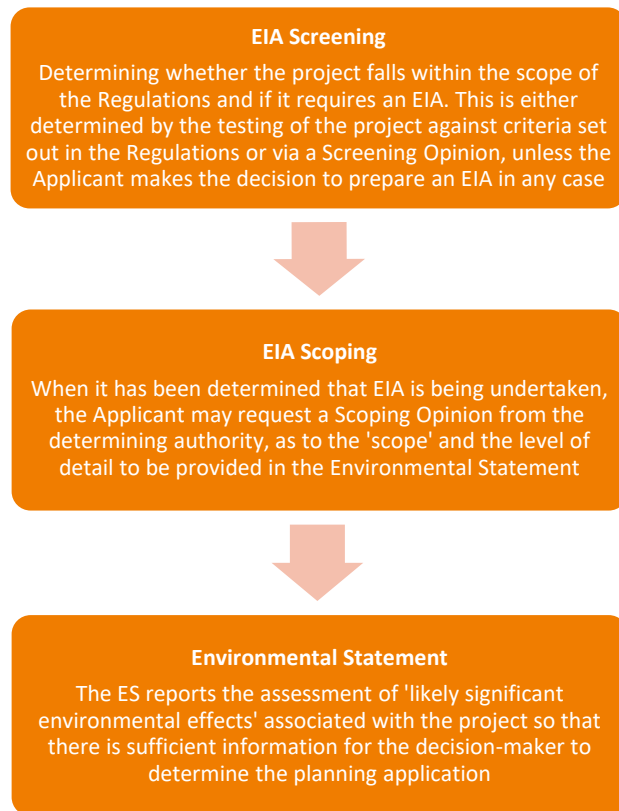
2.38 Broadly, the do-nothing scenario would see the mixture of adverse and beneficial effects of the Project for Assessment (as summarised in **Section 5**) will not occur. The existing land uses within the Assessment Boundary would also likely continue to be as they currently are, aside from greater degradation of existing bog habitats. Conditions in the wider area would change due to:

- Traffic growth due to other development pressures, etc.;
- Reduction in energy-related greenhouse gas emissions to achieve the Government’s target of ‘net zero’ by 2050;
- Further deterioration in the range and condition of habitats currently present due to management pressures;
- Changes in surface water drainage patterns; and
- Climate change, including changes in rainfall.

3. The EIA Process and Approach

Overview

- 3.1 As noted in **Section 1**, EIA is a process and it comprises a series of steps. These are summarised in **Extract 9** below.



Extract 9: Key steps in the EIA process

What has the EIA process involved?

- 3.2 EIA Screening was not undertaken as the Applicant volunteered to prepare an EIA given the likelihood of significant environmental effects due to the nature and location of the Project for Assessment.
- 3.3 Therefore, the first step was EIA Scoping, a process originally undertaken as part of the 2025 ES. At this step, the 'scope' of the ES was identified using a series of baseline studies and surveys, preliminary appraisal of impacts and the development of mitigation. Where topics and / or specific effects were identified to be unlikely or not significant, these were discounted from further assessment. Where a potential for likely significant effects was determined, these topics / and or specific effects were proposed to be taken forward for a more detailed assessment.
- 3.4 The EIA Scoping exercise was presented in an EIA Scoping Report that was submitted to RMBC and RBC on 16th December 2024. Within the EIA Scoping Report, the following topics were proposed to be 'scoped out' as no likely significant effects were anticipated:
- Agricultural land;
 - Air quality;

- Artificial lighting;
- Aviation and radar;
- Flood risk;
- Ground conditions, land contamination and minerals;
- Major accidents and / or disasters;
- Socio-economics and human health;
- Telecommunications; and
- Waste and resources.

3.5 Within the EIA Scoping Report, the following topics were proposed to be ‘scoped in’ due to the potential for likely significant effects:

- Transport and access;
- Noise and vibration;
- Shadow flicker;
- Ecology;
- Ornithology;
- Landscape and visual;

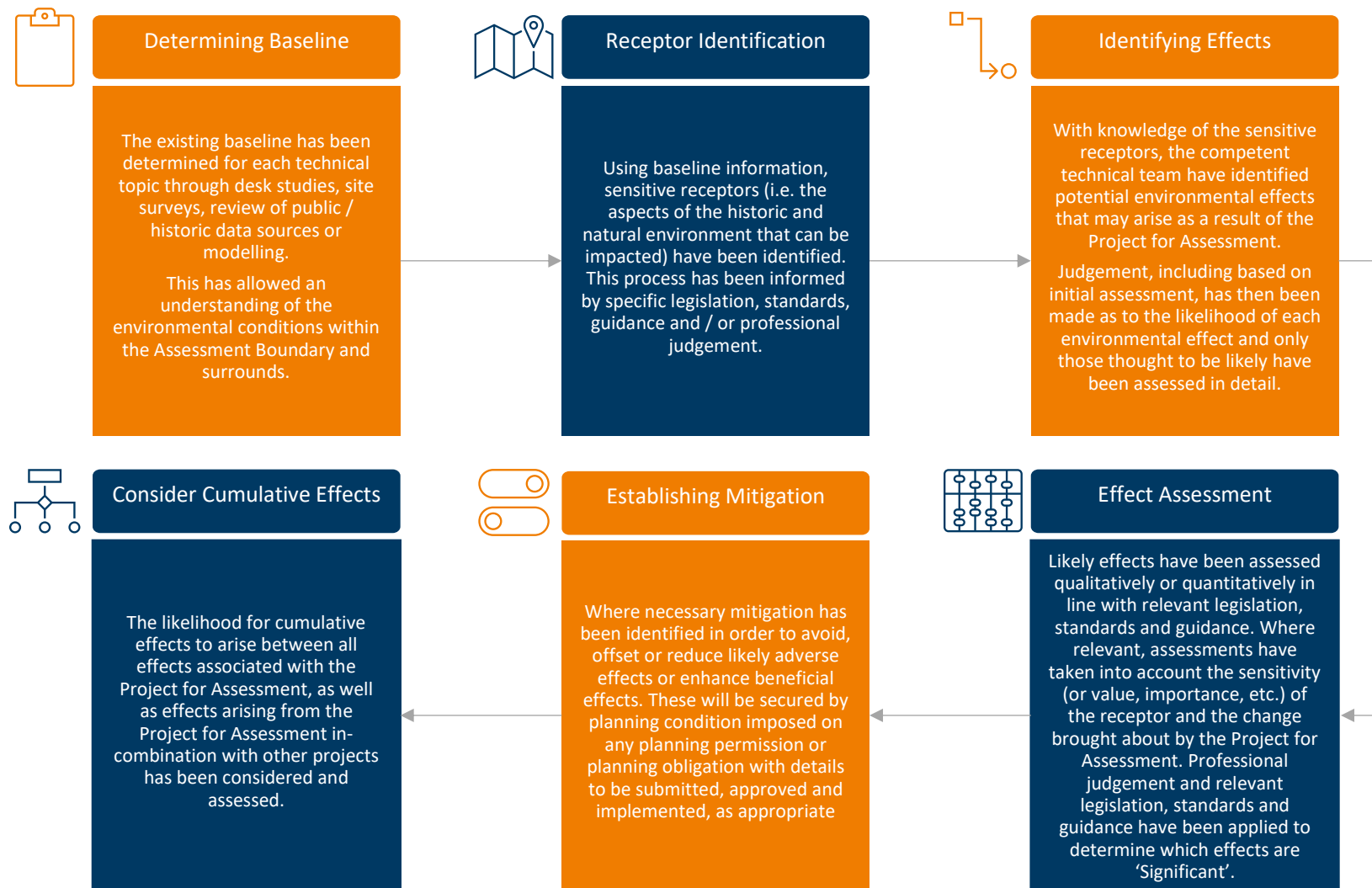
- Built heritage;
- Archaeology;
- Hydrology, hydrogeology and peat; and
- Climate change.

3.6 A Scoping Opinion has not yet been received at the time of writing (June 2026). In the absence of a Scoping Opinion, the scope of the ES has been informed by the EIA Scoping Report and consultation responses received in response to the request for a Scoping Opinion and following the submission of the 2025 ES.

3.7 Following the submission of the EIA Scoping Report, there have been a number of updates to the Project for Assessment (e.g. changes in the Assessment Boundary). However, such changes are not considered to materially change the project that was tested through the EIA Scoping process.

3.8 The next step was the preparation of the ES. As set out within **Section 1**, the purpose of the ES is to report the findings of the EIA process.

3.9 The overarching approach adopted to the technical assessments in the ES is set out in **Extract 10**. However, it is worth noting that the precise approach to the assessment of likely significant effects has varied between the various technical topics, reflecting relevant legislation, standards and technical guidance. The methodologies adopted are clearly outlined for each technical topic within **Volume 1** of the ES.



Extract 10: Overview of EIA process

Has decommissioning of the Project for Assessment been considered?

- 3.10 Yes. Decommissioning has been considered as far as possible at this stage given limited information known about exact activities / processes, with the outputs of the construction stage assessments used as a 'proxy'.

Has the potential decommissioning of Scout Moor Wind Farm been considered?

- 3.11 Scout Moor Wind Farm is due to be decommissioned three years after the start of the operational stage of the Project Assessment (i.e. in 2033). Where appropriate, given there is the potential for the Project for Assessment to be operational for a number of years without Scout Moor Wind Farm, two 'scenarios' have been considered – with and without Scout Moor Wind Farm in situ. This applies specifically to the consideration of changes in landscape character and visual amenity and changes in the setting of built heritage assets.

Has micrositing been considered?

- 3.12 A micrositing allowance of 50m is proposed to allow flexibility in the locations of the wind turbines and other infrastructure as these are subject to further engineering design work and environmental / geotechnical investigations. This means the final location of the turbines and infrastructure could be within 50m allowance of where they are currently shown on the plans. Where relevant, this has been considered within the technical assessments reported in the ES.

Who has been consulted?

- 3.13 Briefing sessions (online) were held with planning and other technical officers from RBC and RMBC as well as consultees in January 2025 to provide the opportunity for comments and questions.
- 3.14 A range of non-technical stakeholders have been contacted to raise awareness of what the Applicant and technical team are aiming to assess and achieve as part of the Applications. This includes Local Members of Parliament, business and community groups and education facilities.
- 3.15 Two phases of consultation with the community and wider audiences have been held. The first phase ran between 5th to 26th November 2024 and introduced the principles of the project, communicated the need for new renewables development in the area and the provision of a Community Wealth Fund for the benefit of the local area. Phase two ran from 25th March to 29th April 2025 and was intended to provide an update on the proposals following design evolution and cover more information on matters during the first phase of consultation, such as moorland restoration.
- 3.16 As part of these consultations, a dedicated project website and community information line were set up and maintained, social media adverts and press releases were issued and a number of public exhibitions at venues were held local to the Assessment Boundary. In addition, three technical webinars, covering noise and shadow flicker, protecting peatland and delivering moorland restoration and access and infrastructure were provided.

- 3.17 Since the submission of the 2025 ES, consultation comments have been received on the Applications and taken into account as part of this FEI submission that are presented within **Appendix 2.4.**

4. Description of the Baseline

What are the baseline conditions like?

- 4.1 A summary of relevant baseline information for the technical topics 'scoped in' is provided below.

Transport and access

- There are a number of local and strategic routes in the vicinity of the Assessment Boundary, including B6527, A680, A56, M66 and M65;
- In general, there are no clusters of accidents at any location on the road network considered (the B6527 and A680) or high numbers of accidents involving HGV, for example; and
- There are a number of Public Rights of Way within and in the area surrounding the Assessment Boundary. There are also footways along the local roads in the vicinity of the Assessment Boundary.

Noise and vibration

- The predominant noise sources in the area include wind induced noise (wind passing through vegetation and around buildings), local watercourses, agricultural noise and birdsong. However, there is some road traffic noise and also noise from existing operational wind turbines in the area.

Shadow flicker

- There is not currently considered to be shadow flicker experienced by the identified sensitive receptors (e.g. nearby residential properties).

Ecology

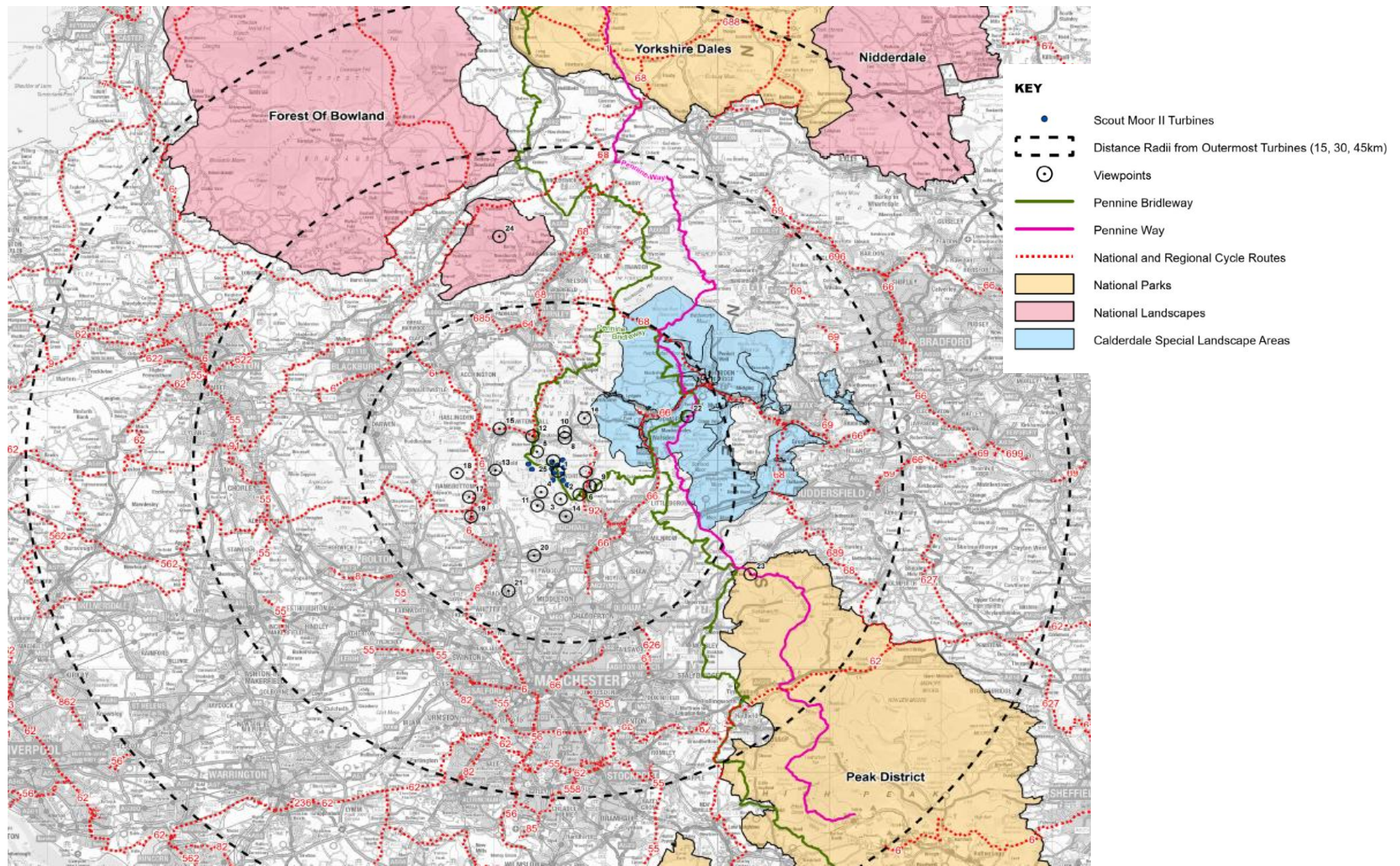
- There are no international / national ecological designations within or immediately surrounding the Assessment Boundary designated for ecological purposes. There are two local designations within / adjacent to the Assessment Boundary – Knowl Moor Site of Biological Importance (SBI) and Scout Moor Biological Heritage Site (BHS);
- There are a range of sensitive habitats, including blanket bog, acid grassland, soft rush and waterbodies / watercourses; and
- Species of conservation concern, including foraging and commuting bats, badgers, water voles, otters, amphibians and reptiles.

Ornithology

- There are a number of designated sites with bird qualifying features (i.e. birds are the reason for their importance and designated as protected areas) within the vicinity of the Assessment Boundary. Key identified sensitive bird species including Merlin, Kestrel, Curlew, Lapwing and Dunlin.

Landscape and visual

- The Assessment Boundary is not located within a national or local designation. However, there are a number of such designations in the surrounding area, including the Peak District National Park, Forest of Bowland National Landscape and Calderdale Special Landscape Area. These are shown on **Extract 11**.



Extract 11: Landscape designations

- The Project for Assessment falls within Landscape Character Area (LCA) A1: South Pennine Moors and LCA 24: Knowl and Rooley Moors, Fringes and Foothills;
- The wind turbines are likely to be visible from most areas within 10km of the Assessment Boundary. In addition, the wind turbines are likely to be visible from higher ground to the east at Holcombe Moor, the Forest of Rossendale to the north of Burnley alongside areas within Rawtenstall, Bacup, Rochdale, Heywood, Chadderton, Whitefield and Bury. Beyond these areas, there may be some visibility of the wind turbines, but this would be more limited; and
- Receptors likely to have views of the Project for Assessment include local residents / settlements, users of the moors and reservoirs, users of Public Rights of Way, roads and nearby estates as well as people visiting specific viewpoints (e.g. Knowl Hill and Peel Tower).

Built heritage

- There are no designated heritage assets within the Assessment Boundary. However, there are a number of assets in the area surrounding the Assessment Boundary. The key identified assets include:
 - Catley Lane Head Conservation Area;
 - Prickshaw and Broadley Fold Conservation Area;
 - Whitworth Square Conservation Area;
 - Smallshaw Farmhouse (Grade II Listed Building);

- Prickshaw Cottages (Grade II Listed Building);
- Church of St. Bartholomew (Grade II Listed Building);
- Church of St. Saviour, Bacup (Grade II Listed Building);
- Church of St. John the Evangelist, Facit (Grade II Listed Building);
- Peel Monument, Holcome Hill (Grade II Listed Building);
- Whitworth Cemetery (Grade II Listed Registered Park and Garden (RP&G)); and
- Rooley Moor Road (non-designated heritage asset).

Archaeology

- There are no statutorily designated archaeological remains within the Assessment Boundary. There are numerous non-designated heritage assets across the Assessment Boundary and within 1km of the Assessment Boundary. Recorded heritage assets are from the prehistoric (circa 14,000 BC – AD 43); early medieval (circa AD 410 – 1066); medieval (1066 – 1540); and post-medieval to modern (1540 – present day) eras; and
- Peat is present in the Assessment Boundary, which has the potential to conceal earlier ground surfaces (and any

artefacts), preserve organic remains and retain paleoenvironmental² evidence.

Hydrology, hydrogeology and peat

- There is a mix of soil types across the Assessment Boundary. Peat is recorded across much of the Assessment Boundary. However, there are areas, some fairly large, where no peat is present. The largest areas absent of peat are in the southern section of the Assessment Boundary. Peat is deepest in the western part of the Assessment Boundary, where it occupies a hilltop area;
- The underlying bedrock is a combination of the Upper Haslingden Flags, Rossendale Formation, Pennine Lower Coal Measures Formation and Woodhead Hill Rock. The superficial deposits include areas of peat and a small portion of Diamicton Head;
- There are a range of surface water features on-site, including watercourses, brooks, drains, springs and wells on-site. The on-site hydrogeology is influenced by the underlying bedrock and superficial deposits, with groundwater primarily moving through fractures, faults and permeable sandstone layers;
- There are a number of reservoirs in the vicinity of the Assessment Boundary which provide public water supplies,

including Naden Higher Reservoir, Cowm Reservoir and Cowpe Reservoir;

- There are also sources of private water supplies present within the Assessment Boundary; and
- There are Groundwater Dependent Terrestrial Ecosystems³ present within the Assessment Boundary and in the surrounding area.

Climate change

- As a worst-case⁴ greenhouse gas (GHG) emissions from the Assessment Boundary are assumed to be zero.

² i.e. evidence of past environmental conditions.

³ Habitats that are dependent on groundwater to exist / function.

⁴ i.e. any effect of the Project for Assessment would be considered against a worst-case of no greenhouse emissions from the Assessment Boundary.

5. Effects of the Project for Assessment

What were the key findings of the EIA process?

5.1 A summary of the key findings of the EIA process reported within **Volume 1** is provided in this section.

5.2 The focus of the reporting is on:

- The effects considered – during construction and / or operation;
- The receptors assessed;
- What the assessment identified, in particular the residual effects (i.e. those after the implementation of mitigation) and whether the effects are **Significant** or **Not Significant**.

5.3 Effects during decommissioning are listed separately, at the end of this section.

5.4 The summary is reflective of the scope of assessments, as discussed within **Section 3** and therefore technical topics or effects ‘scoped out’ have not been discussed. Effects arising from the construction, operational and decommissioning stages of the Project for Assessment have been considered, where relevant. Where the text only considers one of these stages, this is due to the fact that effects associated with the other stage were also ‘scoped out’.

5.5 Key findings are summarised across the technical topics considered in the ES in the table below, where:

- No significant effects identified – denoted by ✕;
- Significant adverse effects identified – denoted by ✓^{red}; and
- Significant beneficial effects identified – denoted by ✓^{green}.

Technical topic	Were significant effects identified?
Transport and access	✕
Noise and vibration	✕
Shadow flicker	✕
Ecology	✓ ^{green}
Ornithology	✕
Landscape and visual	✓ ^{red}
Built heritage	✕
Archaeology	✓ ^{red}
Hydrology, hydrogeology and peat	✕
Climate change	✓ ^{red} /✓ ^{green}

Transport and Access

What effects were considered?

5.6 The following effects were considered in **Chapter 6: Transport and Access**:

- Transport-related effects during construction (severance, driver delay, pedestrian delay, pedestrians / cyclist (i.e. non-motorised) users amenity, fear and intimidation, accidents and safety and abnormal loads).

What receptors were assessed?

- Users of the B6527 and A680 and residents of communities living alongside both roads; and
- Users of Public Rights of Way on-site (including path, bridleway and Public Rights of Way Users).

What did the assessment identify?

5.7 Vehicular movements at the peak of construction will see up to 208 daily movements (100 Car / light good vehicles and 108 heavy good vehicles (HGVs) (e.g. lorries) journeys). When these proposed movements were considered in the context of existing traffic on the local highway network, the greatest increase was on the B6527 at 4.17%. The increase in HGV movements is predicted to be larger at 15.27%. However, as the construction stage is temporary and the peak of construction activities is short lived, overall, such effects were concluded to be adverse but **Not Significant**.

5.8 On-site path, bridleway and Public Right of Way users have the

potential to be affected by construction traffic and plant movements within the Assessment Boundary. However, management plans will be implemented, including diversions, implementation of crossing points, signage and speed limits. With these measures in place, the effects were concluded to be adverse but **Not Significant**.

5.9 The application of micro-siting would not materially change the conclusions outlined above.

Noise and Vibration

What effects were considered?

5.10 The following effects were considered in **Chapter 7: Noise and Vibration**:

- Disturbance associated with construction noise; and
- Disturbance associated with operational noise.

What receptors were assessed?

5.11 The following receptors were assessed:

- Residential properties surrounding the Assessment Boundary (selected to be representative of residents to construction and operational noise).

What did the assessment identify?

5.12 Construction stage works will include earthworks, turbine installation, etc. These types of work will lead to noise generation. For the majority of residents, predicted noise levels at the receptors assessed were found to be well below the

threshold level for a significant effect during both the day and night time. This threshold level is established in *British Standard 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites*. The exception to this was for a property on Scout Road due to potential plant operations within the temporary laydown area. However, with the timing of works in this area and avoidance of plant operating during night-time hours (i.e. 23:00 – 07:00) where possible, noise effects at this receptor would reduce. Therefore, overall, the effects were concluded to be **Not Significant**⁵.

5.13 During operation, the wind turbines will generate noise from the movement of the blades and supporting infrastructure. The assessment has been undertaken in accordance with the relevant guidance, including *Assessment and Rating of Wind Turbine Noise* (ARWTN). This provides a robust basis for determining acceptable noise limits for wind farm developments. The test applied to operational noise is whether or not the calculated wind farm noise levels at nearby noise sensitive properties would be below the noise limits derived in accordance with ARWTN and this is used to inform the assessment of likely significant effects. Sensitive residents identified are shown in **Extract 12**.

5.14 Based on prevailing background noise levels, Total Noise Assessment Criteria (TNAC) were established at each residential location (Noise Assessment Location). The predicted wind turbine noise immission levels from the Project for Assessment

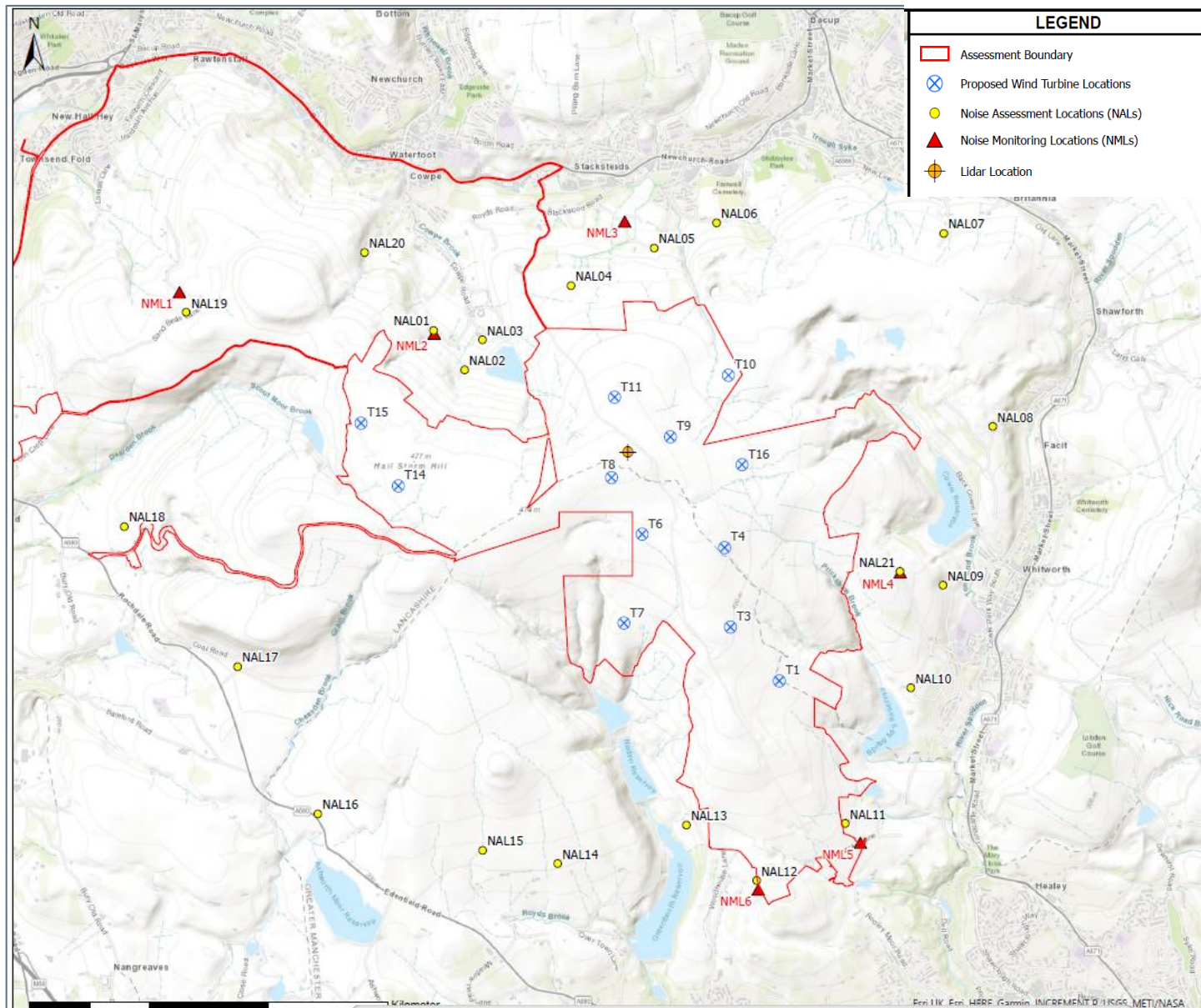
alongside other wind farm schemes in the vicinity (e.g. Scout Moor Wind Farm) were then compared to identify whether the predictions are within 10 decibels (dB) of each other. Where they were, then a cumulative noise assessment of these noise sources was required.

5.15 In order to protect residential amenity, guidance recommends that all schemes operate within the TNAC. Therefore, a set of Site Specific Noise Limits has been devised at each Noise Assessment Location which determines the proportion of the TNAC that is available for future wind farms taking account of operational wind farms in the area (the residual noise budget). This has identified that for a number of receptors; the relevant limits are met under all conditions in the daytime and night-time periods. For others (NAL2 and NAL4), there would be exceedances of these limits during the daytime period only. Mitigation in the form of wind turbine mode management (e.g. implementing less noisy operating modes of the turbines in certain conditions) has been agreed. This is only required to a limited number of turbines for a specific range of wind speeds and directions. This will ensure that the noise limits are met. With these measures in place, operational noise effects were concluded to be **Not Significant**⁶.

The application of micro-siting would not materially change the conclusions outlined above.

⁵ The nature of the effect (beneficial / adverse) was not concluded for construction noise effects due to the methodology adopted for the assessment.

⁶ The nature of the effect (beneficial / adverse) was not concluded for operational noise effects due to the methodology adopted for the assessment.



Extract 12: Operational noise receptors

Shadow Flicker

What effects were considered?

- 5.16 The following effects were considered in **Chapter 8: Shadow Flicker**:
- Shadow flicker during operation.
- 5.17 Shadow flicker is an effect caused when (under certain combinations of geographical positions, time of day, and year), the sun passes behind a turbine and casts a shadow over neighbouring buildings windows. The rotation of the blades of the turbine causes the shadow on a window to appear to flick on and off.

What receptors were assessed?

- 5.18 The following receptors were assessed:
- Residential properties within 1,500m (10x the maximum rotor diameter) of the proposed turbines.

What did the assessment identify?

- 5.19 Shadow flicker has been a key consideration during the design of the Project for Assessment, and the wind turbine layout strikes a balance between maximising the potential for renewable energy generation while providing appropriate protection of residential amenity from shadow flicker.
- 5.20 Levels of theoretical shadow flicker were predicted and the results found there was potential for shadow flicker to occur at all residential properties assessed. Appraisal was then undertaken against a 30 hours per year and 30 minutes per day

threshold informed by international guideline limits (in the absence of UK specific guidance). This identified the potential for effects at nearby residents.

- 5.21 To reduce any effects, a shadow flicker turbine control system will be installed. This can be used to deactivate the wind turbines should shadow flicker effects be possible. The system would be designed based on a detailed survey undertaken post-consent. With these measures in place, shadow flicker effects were concluded to be adverse but **Not Significant**.
- 5.22 The application of micro-siting would not materially change the conclusions above.

Ecology

What effects were considered?

- 5.23 The following effects were considered in **Chapter 9: Ecology**:
- Habitat loss, modification of habitats through hydrological change, altered hydrological pathways, disturbance (via noise and light), fragmentation of species ranges or habitats and injury / mortality during construction; and
 - Disturbance (via noise and light), fragmentation of species ranges or habitats, injury / mortality from collision and altered hydrological pathways during operation.

What receptors were assessed?

- 5.24 The following receptors were assessed:
- Knowl Moor SBI and Scout Moor BHS;

- Habitats, including degraded blanket bog habitats, acid grassland, species-poor soft rush and watercourses and waterbodies; and
- Species of conservation concern, comprising bats (foraging and commuting), badgers, water voles, otters, reptiles and amphibians.

What did the assessment identify?

- 5.25 During construction of the wind turbines and proposed infrastructure, there could be habitat loss, modification of habitats through hydrological change and altered hydrological pathways which could affect locally designated sites that are within / adjacent to the Assessment Boundary (i.e. Scout Moor BHS and Knowl Moor SBI). Measures will be implemented to avoid / reduce both direct and indirect impacts, such as sediment / silt fences and ensuring that vehicles do not stray onto areas adjacent to site infrastructure. With these measures in place, effects on designated sites were concluded to be **Not Significant**.
- 5.26 There could be loss and modification of habitats on-site during construction, including degraded blanket bog habitat, acid grassland, species-poor soft rush and watercourses / waterbodies. Mitigation will comprise construction management measures to reduce habitat removal / disturbance, delivery of new habitats and the moorland restoration proposals. With these measures, the effects on some habitats were concluded to be adverse though **Not Significant** with the exception of some blanket bog habitats where effects were concluded to be

beneficial and **Significant** as a result of the measures within the Moorland Restoration and Management Plan.

- 5.27 Construction is also anticipated to cause disturbance, changes in habitats and potentially injury / mortality for bats (commuting and foraging), badgers, water vole, otter, amphibians and reptiles. With mitigation measures, including habitat improvements and construction management techniques, effects were concluded to be adverse but **Not Significant**.
- 5.28 During the operational stage, effects are anticipated only on bats (foraging and commuting) due to turbine collisions. However, bat activity was low to moderate, and the main species present were at low risk from wind farms. With mitigation measures also in place, operational effects were concluded to be adverse but **Not Significant**.
- 5.29 The application of micro-siting would not materially change the conclusions above.

Ornithology

What effects were considered?

- 5.30 The following effects were considered in **Chapter 10: Ornithology**:

- Displacement due to loss and degradation of habitats and disturbance during construction and operation;
- Population decline of breeding upland birds within the West Pennine Moors Site of Special Scientific Interest during construction and operation; and

- Increased mortality due to collision during operation.

What receptors were assessed?

5.31 The following receptors were assessed:

- Key bird species, including lapwing, dunlin, curlew, merlin and kestrel (some of which form part of the West Pennine Moors Site of Special Scientific Interest (SSSI) designation).

What did the assessment identify?

- 5.32 During construction, disturbance and displacement could occur when human activity (e.g. presence of machinery) causes the birds to change their habits and avoid the area. This could impact on bird populations associated with the West Pennine Moors SSSI. However, there are relatively low numbers of birds using the Assessment Boundary as established through a series of surveys. Mitigation includes the implementation of a CEMP which will detail ecological information regarding the timings of works to avoid the breeding bird season. With these measures in place, effects were concluded to be adverse but **Not Significant**.
- 5.33 During operation, there is the potential for disturbance and displacement and impacts on bird populations associated with the West Pennine Moors SSSI. This is a result of the presence of the infrastructure associated with the Project for Assessment, where previously there was no such infrastructure, along with ongoing maintenance on the Project for Assessment. There is also the potential for collision with the operational wind turbines. However, collision risk modelling showed the risk to be low for curlew, lapwing and merlin with a higher risk for kestrel,

though still relatively small in the context of the wider population and continued presence in the area despite the existing Scout Moor Wind Farm. Therefore, overall effects were concluded to be adverse but **Not Significant**.

- 5.34 The application of micro-siting would not materially change the conclusions above.

Landscape and Visual

What effects were considered?

5.35 The following effects were considered in **Chapter 11: Landscape and Visual**:

- Changes in landscape character and features during construction and operation;
- Changes in views / visual amenity during construction and operation;
- Effects on the special qualities of designated landscapes during operation; and
- Night-time landscape and visual effects during operation.

What receptors were assessed?

5.36 The following receptors were assessed:

- Landscape character areas, including those that cover the Assessment Boundary (South Pennine Moors and Knowl and Rooley Moors, Fringes and Foothills) and selected areas within 20km;

- Settlements within 10km including Norden and Wolstenholme, Rochdale, Catley Lane Head, Whitworth, Bacup, Newchurch, Stacksteads, Cowpe, Rawtenstall, Haslingden, Edenfield, Ramsbottom, Greenmount and Summerseat, Bury and Tottington, Hooley Bridge and Heywood;
- Users of recreational routes and places of interest, including Rooley Moor, Knowl Moor, Scout Moor and Lobden Golf Course, Cowm Reservoir, Ashworth Moor Reservoir, Holcombe Moor and Stubbins Estate, Burrs Country Park, Hollingworth Country Park, Tandle Hill Country Park, Pennine Bridleway, Rossendale Way, Rochdale Way, Irwell Sculpture Trail, Calderdale Way, Oldham Way, Witton Weavers Way, National Cycle Route 6, National Cycle Route 92 and specific viewpoints at Knowl Hill and Peel Tower;
- Key transport routes, including M60, M61, M62, M66, A56, A58, A6 and A62; and
- Designated landscapes, including the Peak District National Park, Forest of Bowland National Landscape and Calderdale Special Landscape Area.

What did the assessment identify?

5.37 During construction, there will be physical changes such as vegetation clearance and the installation of site access tracks alongside the introduction of plant and equipment. This will have the largest effects on the 'host' landscape character areas,

including the South Pennine Moors and Knowl and Rooley Moors, Fringes and Foothills, and were concluded to be adverse and **Significant**. Effects extend to other landscape character areas in the surrounding area, albeit these effects were concluded to be adverse but **Not Significant**.

- 5.38 There will also be changes in views / visual amenity due to the construction works and activities from surrounding settlements and recreational routes and places of interest (e.g. the plant to install the wind turbines). For routes / areas in close proximity to these works, effects were concluded to be adverse and **Significant** and for settlements and routes further away the effects were determined to be adverse though **Not Significant**.
- 5.39 During operation, the Project for Assessment will result in long-term albeit reversible changes to landscape character. Again, the largest change will occur within the 'host' landscape character areas, including the South Pennine Moors and Knowl and Rooley Moors, Fringes and Foothills, as the vertical height and movement of the wind turbines would notably add to the influence of wind energy infrastructure within this landscape. The Project for Assessment will reduce the sense of isolation and wildness in some parts of these character areas. However, there are existing wind turbines, such as those as part of the Scout Moor Wind Farm. Overall, effects on the 'host' landscape character areas considered to be adverse and **Significant**.
- 5.40 For landscape character areas including Scout Moor and Shore Moor Fringe, Irwell (Ramsbottom, Rawtenstall and Bacup) and Rossendale Hills there would be impacts due to the contrast of

the wind turbine with the horizontal skyline and the increase in the influence and perception of wind energy development as well as some change to perceptual and scenic qualities. Effects on these character areas were also concluded to be adverse and **Significant**.

- 5.41 There would also be effects on wider character areas such as the River Irwell (north Bury) and Kirklees and River Roch, associated with the increase / extension in the influence of wind energy development and some changes in perceptual qualities. In the context of the existing conditions with Scout Moor Wind Farm, all effects were concluded to be adverse but **Not Significant**. However, in a future scenario without Scout Moor Wind Farm, effects on the West Pennine Moors (Holcombe Moor unit) and Holcombe to Greenmouth and Higher Summerseat (Holcombe Moor unit) would be adverse and **Significant**.
- 5.42 The Project for Assessment will result in changes to views / visual amenity for residents / settlements, users of recreational routes and visitors to places of interest / viewpoints. The impacts on these receptors vary dependent on screening by landform and built environment.
- 5.43 For nearby settlements including Norden, Wolstenholme, Catley Lane Head, Whitworth, Bacup, Newchurch, Stacksteads, Cowpe, Rawtenstall, Hooley Bridge and Heywood, the wind turbines would be obvious on the skyline and would result in an enlarged cluster of wind energy development. Effects were concluded on these settlements to be adverse and **Significant**.

- 5.44 For other settlements with less direct views / situated further away, including Rochdale, Haslingden, Edenfield, Ramsbottom, Greenmount and Summerseat, Bury and Tottington whilst the wind turbines would be obvious and extend the existing array, effects were concluded to be adverse though **Not Significant** in existing conditions with Scout Moor Wind Farm. However, in a future scenario without Scout Moor Wind Farm, effects would be adverse and **Significant**.
- 5.45 Users of Rooley Moor, Knowl Moor, Scout Moor, Cowm Reservoir, Holcombe Moor and Stubbins Estate, Pennine Bridleway, Rossendale Way, Rochdale Way, Irwell Sculpture Trail and National Cycle Route 92 have more direct views, and the wind turbines would be a noticeable addition to the skyline. Effects were concluded on these receptors to be adverse and **Significant**.
- 5.46 Users of National Cycle Route 6, Hollingworth Country Park, viewpoints at Knowl Hill and Peel Tower and the M66 are more distant / the additional wind turbines would not be dissimilar to the existing composition and other aspects of the view for these receptors would remain unchanged. Therefore, the effects in the existing baseline conditions with Scout Moor Wind Farm were concluded to be adverse though **Not Significant**. However, in a future scenario without Scout Moor Wind Farm, effects would be adverse and **Significant**.
- 5.47 For users of Ashworth Moor Reservoir, Burrs Country Park, Tandle Hill Country Park, Calderdale Way, Oldham Way, Witton Weavers Way, M60, M61, M62, A56, A58, A6 and A62, the wind

turbines would be perceptible in the distance / in oblique views or largely screened by existing landform. As such, effects were concluded to be adverse but **Not Significant**.

- 5.48 The wind turbines are potentially visible from the Peak District National Park, Forest of Bowland National Landscape and Calderdale Special Landscape Area. However, through a review of the 'special qualities' of these areas, it was determined that all effects are adverse but **Not Significant**.
- 5.49 During night time, the Project for Assessment will require visible aviation lighting from a safety perspective and lights would be noticeable as a new feature within the views. However, a reduced lighting scheme has been agreed with the Civil Aviation Authority. The visible lights will be operated by a suitable control device such that the lights are only turned on 'night' defined as 30 minutes before sunset to 30 minutes after sunrise. Automatic dimming to 200 candela (cd) will also be used to reduce light intensity.
- 5.50 when visibility in all directions is greater than 5km. With this in place, effects from lighting were only considered to be adverse and **Significant** at Catley Lane Head, Whitworth, Bacup, Newchurch, Stacksteads and Rawtenstall, Cowpe, and recreational users of the Holcombe Moor and Stubbins Estate.

- 5.51 The application of micrositing would not materially change the conclusions above.

Built Heritage

What effects were considered?

- 5.52 The following effects were considered in **Chapter 12: Built Heritage**:

- Harm to the heritage significance of Conservation Areas, listed buildings, Registered Parks and Gardens (RP&Gs) and non-designated heritage assets as a result of change within their setting⁷.

What receptors were considered?

- 5.53 The following receptors were assessed:

- Catley Lane Head, Prickshaw and Broadley Fold and Whitworth Square Conservation Areas;
- Smallshaw Farmhouse, Prickshaw Cottages, Church of St. Bartholomew, Church of St. Saviour, Bacup, Church of St. John the Evangelist, Facit and Peel Monument, Holcome Hill (Grade II Listed Buildings);
- Whitworth Cemetery (Grade II Listed RP&G); and
- Rooley Moor Road (non-designated heritage asset).

⁷ Setting is the surroundings in which a heritage asset is experienced (e.g. viewed and appreciated).

What did the assessment identify?

- 5.54 Construction activities will be visible in proximity to the identified heritage assets or in views towards the identified assets, reducing the rural surroundings / backdrop. However, the key features of the heritage assets would remain largely unchanged, and views are in part already affected by modern infrastructure (such as electricity pylons). Therefore, all effects were concluded to be adverse though **Not Significant**.
- 5.55 Once completed and operational, the Project for Assessment would introduce new modern features into the wider rural surroundings / backdrop of Catley Lane Head Conservation Area, Prickshaw and Broadley Fold Conservation Area, Prickshaw Cottages, Smallshaw Farmhouse and Rooley Moor Road. This would reduce the sense of remoteness, although there is evidence of human activity on the moorland including mining and quarrying activities and existing modern infrastructure. For the other assets assessed, there would be visibility of wind turbines, and these would appear on the moorland above the assets / in views in specific directions. This would extend the existing wind farm development across the skyline and in some cases diminish the landmark status of some buildings. However, the ability to understand the heritage assets architectural and historical features and importance will remain despite the visibility of the Project for Assessment. Therefore, all effects were concluded to be adverse though **Not Significant**.
- 5.56 Effects in the existing baseline conditions with Scout Moor Wind Farm and those in a future scenario without Scout Moor Wind Farm were concluded to be the same.

- 5.57 The application of micrositing would not materially change the conclusions outlined above.

Archaeology

What effects were considered?

- 5.58 The following effects were considered in **Chapter 13:**

Archaeology:

- Loss / disturbance to known and unknown archaeological assets and buried remains during construction; and
- Loss / reduction in deposit preserving paleoenvironmental remains as a result of dewatering activities during construction and operation.

What receptors were assessed?

- 5.59 The following receptors were assessed:

- Known archaeological assets (e.g. Rooley Moor Road);
- Potential / unknown buried archaeological resource and paleoenvironmental remains within the Assessment Boundary; and
- Peat deposits containing paleoenvironmental remains within and beyond the Assessment Boundary.

What did the assessment identify?

- 5.60 Groundworks during construction can cause the loss or / disturbance of archaeological remains. However, prior to the commencement of works, a programme of archaeological

fieldwork will be undertaken to identify any remains and their condition, extents, etc. This will allow for development of a programme of public benefit, which will include sharing valuable knowledge and interpretation of the archaeological landscape.

- 5.61 Some archaeological features or assets will be preserved where they are in the Assessment Boundary and appropriate fencing will be installed to prevent inadvertent damage by vehicle movements. Overall, with these measures, effects on archaeological remains were largely concluded to be adverse though **Not Significant** except for impacts on unknown remains from the prehistoric period which could be adverse and **Significant** dependent on the remains encountered and mitigation deployed.
- 5.62 There is also the potential for changes in drainage patterns from the Project for Assessment which could result in the deterioration of peat deposits and any associated archaeological or paleoenvironmental remains. This could occur within or beyond the Assessment Boundary. The Project for Assessment will include peat restoration and drain blocking, which is not expected to impact below ground remains. In addition, further works will identify deposits which have the potential to preserve paleoenvironmental remains and thus allow for investigation of past environmental conditions and provide opportunities for scientific dating, improving current levels of knowledge. With these measures, effects were concluded to be adverse but **Not Significant**.

- 5.63 The application of micro-siting would not affect the majority of the conclusions outlined above. However, where known archaeological remains are avoided, this would remove the impact altogether.

Hydrology, Hydrogeology and Peat

What effects were considered?

- 5.64 The following effects were considered in **Chapter 14: Hydrology, Hydrogeology and Peat**:

- Erosion and sedimentation effects;
- Alteration of flow, natural drainage patterns / runoff volumes and rates;
- Potential pollution events affecting groundwater and surface water quality;
- Peat landslide hazard risk; and
- Loss, degradation and disturbance of the peat resource.

What receptors were assessed?

- 5.65 The following receptors were assessed:

- Surface water features;
- Public water supplies;
- Private water supplies;

- Groundwater Dependent Terrestrial Ecosystems; and
- Peat resource.

What did the assessment identify?

- 5.66 A number of effects could interact and affect surface water features, public water supplies, private water supplies and Groundwater Dependent Terrestrial Ecosystems during construction. However, infrastructure within the Assessment Boundary has been located, in so far as possible over 30m from watercourses or waterbodies. All works will be undertaken using good practice methods. In addition, further investigations into water supplies will be undertaken, where appropriate. Therefore, such effects were concluded to be adverse though **Not Significant**.
- 5.67 As above, a number of the effects identified could combine to impact the peat resource on-site, causing loss / disturbance during construction. However, the best quality peatland has been avoided through the design process, and all excavated peat is considered to have been 'modified'.
- 5.68 More than 75% of the Project for Assessment is located on areas with <1m of peat depth and the peat to be excavated is circa 2.1% of the total volume within the Assessment Boundary. In addition, an Outline Peat Management Plan has been prepared and is an integral part of the project to ensure the appropriate handling, storage and reuse of peat. Furthermore, the moorland restoration proposals will be implemented during construction.

Overall, effects were concluded to be adverse though **Not Significant**.

- 5.69 A number of effects could interact and affect surface water features, public water supplies, private water supplies and Groundwater Dependent Terrestrial Ecosystems during operation. However, only limited operational activity will occur (e.g. maintenance). Such effects were concluded to be adverse but **Not Significant**.
- 5.70 As above, a number of the effects identified could combine to impact the peat resource on-site. However, no new infrastructure is planned post-construction, and long-term peatland restoration and management is expected to continue. This includes the ongoing stabilisation of degraded peatland areas through re-wetting and revegetation and minimal disturbance through access or inspection activity, providing a benefit compared to the existing situation. Overall, effects were concluded to be adverse though **Not Significant**.
- 5.71 The application of micro-siting would not materially change the conclusions above.

Climate Change

What effects were considered?

- 5.72 The following effects were considered in **Chapter 15: Climate Change**:
- Greenhouse gas (GHG) emissions, savings and net GHG effect.

What receptors were considered?

5.73 The following receptors were assessed:

- The global climate system.

What did the assessment identify?

5.74 The construction stage of the Project for Assessment will result in GHG emissions from the manufacture of materials required for the turbines, transport of materials, operation of construction machinery, etc. GHG emissions will also be released from disturbing the peat on-site. Effects during the construction stage in isolation were concluded to be adverse and **Significant**.

5.75 Operation of the Project for Assessment presents an opportunity for GHG emissions savings. This is through the use of renewable wind energy generated by the Project for Assessment for electricity production rather than fossil fuels along with moorland restoration, enhancing the peat which is a carbon sink.

5.76 When considering the emissions and savings combined to understand the overall effect of the Project for Assessment on climate change, it was calculated that the GHG emissions from the construction stage would be balanced out with the savings from the operational stage by (at a worst-case) 1.5 years into the operational period. GHG savings would then continue and accumulate for the remainder of the 40 year operational period. This effect was concluded to be beneficial and **Significant**.

5.77 The application of micro-siting would not materially change the conclusions above.

What about effects from the decommissioning stage?

5.78 For decommissioning, effects were considered for noise and vibration, ecology, ornithology, landscape and visual, built heritage, archaeology, hydrology, hydrogeology and peat and climate change.

5.79 Residual effects during this stage are likely to be the same as / no worse than as identified above for the construction stage.

6. Cumulative Effects

What are cumulative effects?

6.1 It is a requirement of the EIA Regulations for an EIA to assess the 'cumulative effects' arising from the Project for Assessment.

There are two types of cumulative effects:

- **Effect interactions:** The interaction of environmental effects of the Project for Assessment affecting the same receptor either within the Assessment Boundary or in the surrounding area. For example, a residential receptor experiencing an increase in noise and change in visual amenity; and
- **In-combination interactions:** The combination of environmental effects of the Project for Assessment with other Cumulative Projects affecting the same receptor. For example, a residential property experiencing noise from two wind farm schemes.

How have cumulative effects been assessed?

6.2 There is no standard methodology for the assessment of cumulative effects, but available guidance documents have been used alongside professional judgement to determine the impacts.

6.3 For both types of cumulative effects there needs to be a 'common receptor', e.g. the same receptor that is considered in either two or more topics (for effect interactions) or by the Project for Assessment and Cumulative Project (for in-combination effects). If there is an absence of a common receptor, it is considered that a cumulative effect does not occur.

What were the findings of the assessment of effect interactions?

6.4 An initial evaluation of effect interactions was completed which looks at all of the effects assessed and then categorises them into 'receptor groups' that are specified within the EIA Regulations⁸. This allows the identification of where there is a potential for an effect interaction.

6.5 These receptor groups are then appraised for both the construction and operational stages considering aspects such as the scale, duration and geographical extent of the effects.

6.6 The following was concluded for construction:

- **Population and human health** – effect interactions likely to be greater than the effects individually and perceived as adverse and **Significant**;
- **Biodiversity** – there are no effect interactions;
- **Cultural heritage** – there are no effect interactions; and

⁸ population, human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and landscape.

- **Water** – there are no effect interactions

6.7 The following was identified for the operational stage:

- **Population and human health** – effect interactions likely to be greater than the effects individually and perceived as adverse and **Significant**;
- **Biodiversity** – effect interactions are likely to be no greater than the effects individually and would be adverse though **Not Significant**;
- **Landscape** – effect interactions likely to be no greater than the effects individually but would be adverse and **Significant**;
- **Cultural heritage** – there are no effect interactions; and
- **Water** – there are no effect interactions.

6.8 The qualitative appraisal determined that the effect interactions during the decommissioning stage would be no greater than that determined for the construction stage.

What were the findings of the assessment of in-combination effects?

6.9 Searches of planning databases were undertaken to identify other wind farm schemes and other Cumulative Projects that should be considered in-combination with the Project for Assessment. The locations of the identified wind scheme schemes are provided in **Extract 13** and a plan showing the

locations of the identified Cumulative Projects is provided in **Extract 14**.

6.10 The evaluation of in-combination effects was then undertaken for the technical topics. The evaluation was informed by technical reports submitted in support of the other projects, or where this was not available, professional judgement was applied. Due to the methodology adopted in **Chapter 15: Climate Change of Volume 1**, in-combination effects are already considered as part of this Chapter (which identified a **Major Beneficial** and **Significant** effect). The evaluation for the other technical topics considered the following, where relevant:

- Do the projects share a common receptor?
- Is there a potential overlap with construction and operational timeframes?
- What is the nature of in-combination effects (i.e. adverse or beneficial)?
- Whether the in-combination effect is greater, the same or lesser than the effect identified for the Project for Assessment in isolation (i.e. reported in this ES)?
- Whether the in-combination effect is Significant or Not Significant?

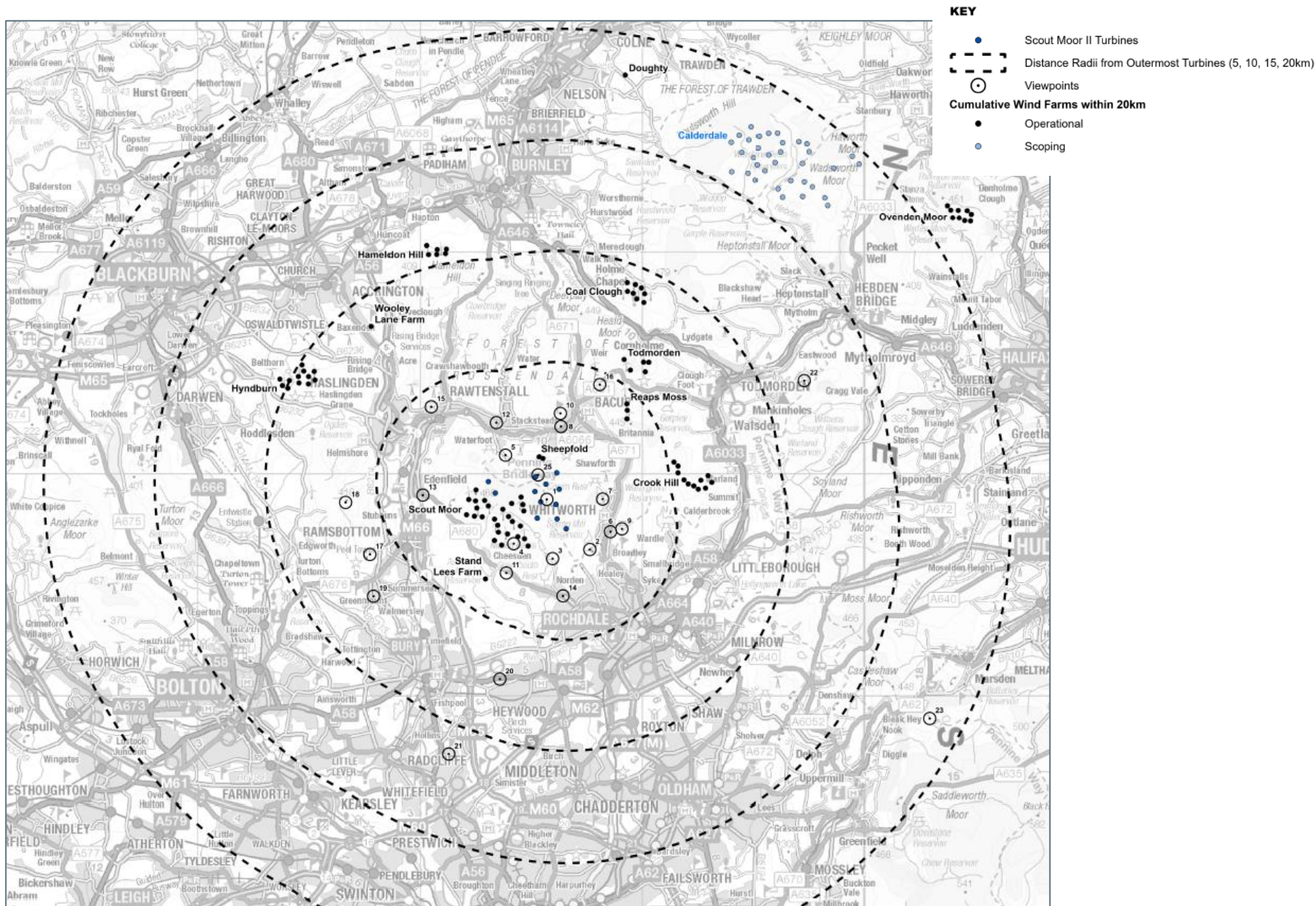
6.11 The evaluation of in-combination effects is normally undertaken qualitatively but for some topics quantitative modelling accounted for the other projects identified (e.g. transport and

access). A summary of the evaluation of in-combination effects is provided within the table below.

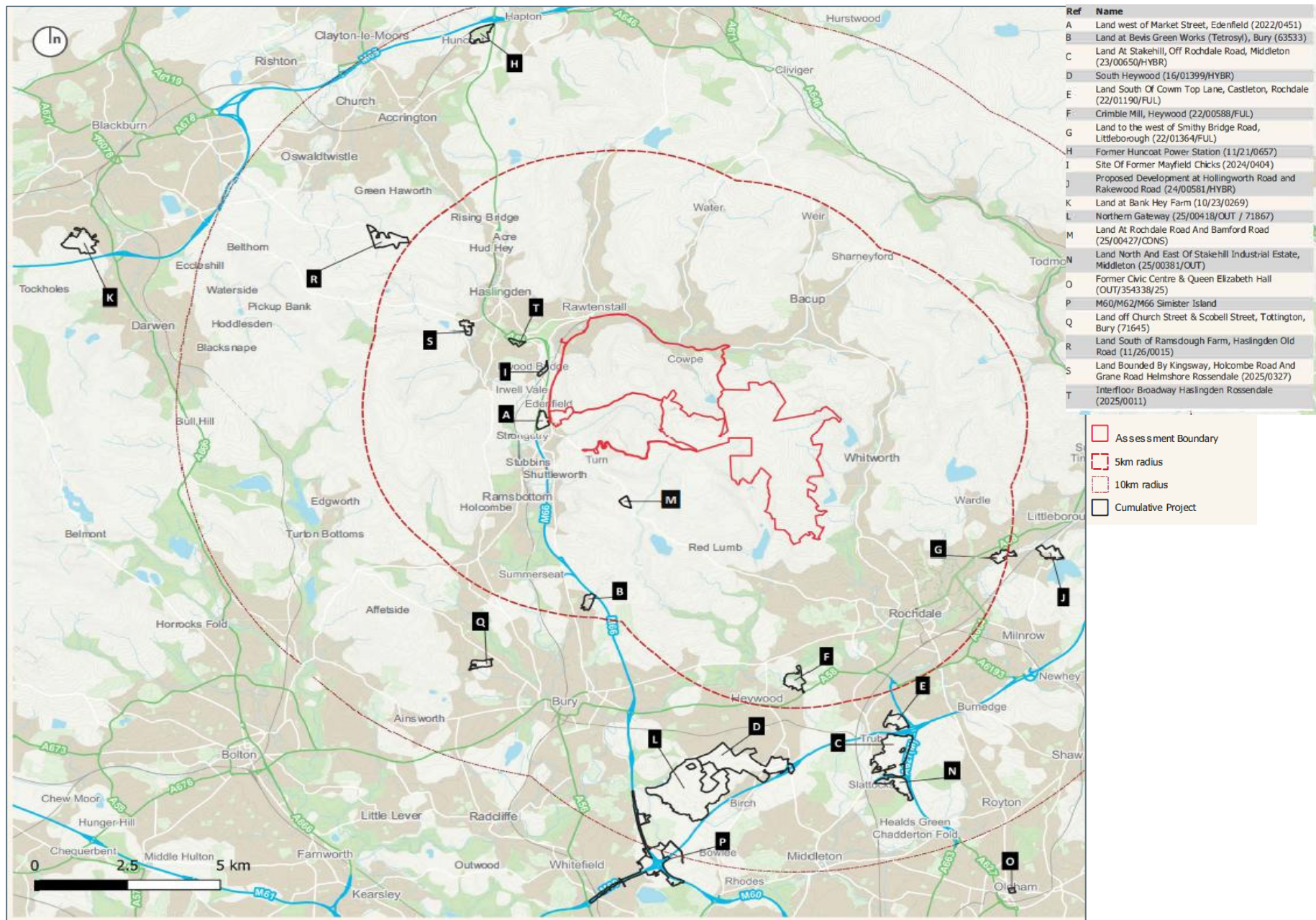
Topic	Summary of in-combination effects
Transport and access	In-combination effects were not identified with a number of Cumulative Projects. Where in-combination adverse effects are likely to occur, these are the same as that identified for the Project for Assessment in isolation and would be Not Significant .
Noise and vibration	In-combination effects were not identified with a number of Cumulative Projects. Where there are potential interactions with other existing wind farm schemes, these have inherently been considered as part of the assessment, as summarised in Section 5 . Therefore, the effects would be Not Significant ⁹ .
Shadow flicker	There are no in-combination shadow flicker effects.
Ecology	In-combination ecological effects are largely either the same or no greater than that identified for the Project for Assessment in isolation and would be adverse but Not Significant . For some receptors there are no in-combination effects.
Ornithology	In-combination ornithological effects are largely the same or no greater than that identified for the Project for Assessment in isolation, with some that would be greater. However, all in-combination effects would be adverse but Not Significant .

⁹ As noted above in **Section 5**, given the methodology adopted for the assessment of noise effects, adverse / beneficial is not attributed to the effect.

Topic	Summary of in-combination effects
Landscape and visual	The assessment found that the additional change from Calderdale Wind Farm would lead to levels of effect no greater than was assessed in the main assessment (for the Project for Assessment in isolation). Where there are potential interactions with other existing wind farm schemes, these have inherently been considered as part of the assessment summarised in Section 5 (where the effects are a mixture of adverse and Significant / Not Significant).
Built heritage	Where there are potential interactions with other existing wind farm schemes, these have inherently been considered as part of the assessment summarised in Section 5 . The in-combination effects with other Cumulative Projects are likely to be the same as that identified for the Project for Assessment in isolation and would be adverse but Not Significant .
Archaeology	In-combination archaeological effects are the same as that for the Project for Assessment in isolation and would be adverse and Not Significant / Significant .
Hydrology, hydrogeology and peat	There is a mixture of no in-combination effects or where these are anticipated, the in-combination hydrology, hydrogeology and peat effects are no greater than that for Project for Assessment in isolation and would be adverse but Not Significant .



Extract 13: Location of wind farm schemes in relation to the Assessment Boundary



Extract 14: Location of Cumulative Projects in relation to the Assessment Boundary

Appendix 1: Regulatory Compliance Checklist

Regulation 18, Paragraph 3 (e) of the EIA Regulations requires ‘a non-technical summary of the information referred to in sub-paragraphs (a) to (d)’ to be provided. Schedule 4, Paragraph 9 of the EIA Regulations requires ‘A non-technical summary of the information provided under paragraphs 1 to 8’ to be provided. To provide clarity on compliance with the EIA Regulations, the checklist below identifies where the information from paragraphs a to d of Regulation 18a and paragraphs 1 to 8 of Schedule 4 is located in this document.

Regulation 18. Environmental Statements	Schedule 4. Information for Inclusion in Environmental Statements	Location of Information in this Non-Technical Summary
(a) a description of the proposed development comprising information on the site, design, size and other relevant features of the development	1. A description of the development, including in particular: (a) a description of the location of the development; (b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases; (c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; (d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.	Section 2: The Project for Assessment and Section 4: Description of the Baseline
(d) a description of the reasonable alternatives studied by the developer, which are relevant to the	2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by	Section 2: The Project for Assessment

Regulation 18. Environmental Statements	Schedule 4. Information for Inclusion in Environmental Statements	Location of Information in this Non-Technical Summary
proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment	the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.	
-	3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.	Section 2: The Project for Assessment and Section 4: Description of the Baseline
-	4. A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.	Section 4: Description of the Baseline and Section 5: Effects of the Project for Assessment
(b) a description of the likely significant effects of the proposed development on the environment	5. A description of the likely significant effects of the development on the environment resulting from, inter alia: (a) the construction and existence of the development, including, where relevant, demolition works;	Section 5: Effects of the Project for Assessment and Section 6: Cumulative Effects

(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;

(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;

(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);

(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;

(g) the technologies and the substances used.

The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC (1) and Directive 2009/147/EC (2).

Regulation 18. Environmental Statements	Schedule 4. Information for Inclusion in Environmental Statements	Location of Information in this Non-Technical Summary
-	6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	Section 5: Effects of the Project for Assessment
(c) a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment	7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.	Section 5: Effects of the Project for Assessment
-	8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU (3) of the European Parliament and of the Council or Council Directive 2009/71/Euratom (4) or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.	Section 3: The EIA Process and Approach

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