

2 EIA METHODOLOGY

Introduction

- 2.1 This chapter sets out the methodology used to prepare each chapter of the ES and describes the ES structure and content. In particular, it sets out the process of identifying and assessing the likely significant effects of the Development on the environment.

Scoping

- 2.2 A formal Scoping Opinion was not requested as the Screening Direction adopted by the Planning Inspectorate confirmed the technical disciplines for which likely significant effects could arise. The topics scoped into the ES comprise Minerals and Agricultural Land. Further information justifying the scoping out of other disciplines identified in the EIA Regulations is provided in Table 2.1 below.

Table 2.1: Topics Scoped out of the ES

Assessment	Scoping Review
Air Quality	The Site is not located in an Air Quality Management Area. An air quality assessment was prepared and submitted with the planning application. The assessment identified the potential for air quality impacts as a result of traffic generated by the Development at existing and proposed residential receptors using the detailed dispersion model, ADMS-Roads. The assessment identified that annual and short-term concentrations of NO ₂ and PM ₁₀ are predicted to be below the respective air quality objectives for both 'without development' and 'with development' at all identified receptor locations therefore the air quality impact of emissions from traffic associated with the Development is predicted to be negligible. The assessment also considered whether the Development could significantly change air quality during the construction phase. With the implementation of mitigation measures the dust impacts from the construction are considered to be not significant, in accordance with IAQM guidance ⁱ . The conclusions of the air quality assessment confirm that this topic can be scoped out of the ES.
Noise and Vibration	A noise assessment was undertaken to predict the potential impact of environmental noise sources at the Site. Computer noise modelling was utilised in addition to baseline noise measurements and the potential impact on the proposed dwellings was determined using guidance provided in Tan 11 ⁱⁱ , BS 8233 ⁱⁱⁱ and WHO Guidelines for Community Noise ^{iv} . The assessment found that the majority of the Site would fall under Tan 11 Noise Exposure Category (NEC) A and B, while a small portion of the proposed housing at the north west perimeter of the Site would fall under NEC C. Mitigation proposals in the form of minimum glazing and ventilation specifications would allow suitable internal noise levels to be achieved across the Site. Furthermore, careful consideration of housing and the orientation of rear gardens, as well as the use of 1.8m high fences, would allow for external noise levels of 50 dBA LAeq and below to be achievable across the Site. The potential noise impact from increased traffic flows associated with the Development was also assessed and the predicted impact was found to be negligible according to DMRB methodology. On this basis no further assessment of the effects of the Development on noise are required and this topic has been scoped out of the ES.

Assessment	Scoping Review
Water Resources and Flood Risk	The site lies within an area designated on Environment Agency Flood mapping as Flood Risk Zone 1. Within Wales, development is covered by Technical Advice Note 15: Development and Flood Risk^v. The TAN15 development advice map for the area identifies that the Site lies within Zone A being land deemed to be at the least risk if flooding. A Flood Consequences Assessment was undertaken in accordance with the requirements of TAN15 which concluded that to minimise the potential for flood risk, a site-wide infiltration system is proposed which will mimic the existing greenfield arrangements and comprise a combination of: • Piped systems outfalling to strategically located infiltration basins. • Soakaways to houses and roads. • Infiltration trenches to supplement, or as an alternative to, soakaways to houses. The details of the drainage design will be prepared as part of reserved matters applications however given the low potential for significant environmental effects associated with flooding this topic has been scoped out of the ES.
Wind Microclimate, Daylight and Overshadowing Effects	Due to the low-rise nature and location of proposed buildings, significant wind, daylight and overshadowing effects are not anticipated and this topic has been scoped out of the EIA.
Lighting	The Development will introduce lighting. The detailed design will be informed by best practice guidance, including Institute of Lighting Professionals (2020) Guidance Notes for the Reduction of Obtrusive Light (Guidance Note 01/2020)^{vi} and BS 5489-1:2020 'Design of road lighting. Lighting of roads and public amenity areas. Code of practice'. As lighting can be effectively mitigated and controlled through appropriate design including carefully angled lighting secured through planning conditions significant effects on the environment are not expected and this topic has been scoped out of the EIA.
Accidents and Disasters	Accidents and disasters could mean earthquakes, fire, or flooding among others. The construction and operation of the Development will comprise well understood processes that will be controlled by strict health and safety legislation and planning conditions as appropriate. Therefore, this topic has been scoped out of the ES.
Climate Change	The Appellants have considered how climate change may affect the Development as an integral part of the masterplanning process. Considerations have included future-proofing and resilience measures which will be incorporated into the detailed design and secured through appropriate mechanisms such as planning conditions. Further to this, the assessments within the ES have assessed the potential for climate effects through the Flood Risk Assessment and Air Quality Assessment well as other mitigation measures seeking to reduce greenhouse gas emissions such as the Travel Plan submitted with the planning application. For a development of this nature, this is considered a suitably proportionate approach, accordingly, an assessment of climate change and greenhouse gases, as a separate chapter, has been scoped out of this ES
Ecology and Nature Conservation	The findings of phase I and phase II ecological surveys, as well as a desk study were used to assess the potential for significant effects on ecological features. The Ecological Assessment, submitted with the planning application, identified the following: • The Site is not covered by, or adjacent to, any areas which are subject to a statutory designation. There are four European designated statutory sites within 10km of the site, and six local wildlife sites within 2km of the Site. Given the residential nature of the Development, the potential size of the Development, the habitats present on-site, and the proximity to the designated sites, no impacts are anticipated; • the Development will mainly affect arable land which is of negligible ecological importance. However, small areas of broadleaved/plantation woodland and defunct hedgerows with field margins, scattered trees, scattered scrub, and ruderal will also be affected (all of site ecological importance). It is anticipated any losses would be mitigated through the planting of woodland as well as native trees and shrubs which will form the landscaping of the new development; • Great crested newt (GCN) <i>Triturus cristatus</i>: surveys conducted in spring 2018

Assessment	Scoping Review
	identified a medium population of GCN in an off-site pond, approximately 100m from the Site boundary. The Development has been designed with parameters to retain opportunities for these species and compensate for the loss of habitats involved. A licence from Natural Resources Wales will be required, and mitigation strategy implemented, before works proceed; • Bats: Low levels of bat foraging activity have been recorded along the interior and exterior field boundaries. The majority of the woodland, hedge and trees on-site are being retained, and new planting and SuDS pond creation in retained areas that currently comprise arable land will enhance foraging opportunities for bats. A sensitive lighting design will reduce the impacts to foraging bats by maintaining dark corridors and directional lighting along retained and newly created habitats. Three trees with moderate potential to support roosting bats were identified, but will not be affected by the Development; any of the trees affected by the Development and identified as having low potential should be subject to soft felling under ecological supervision; • Breeding birds: trees and hedgerows affected by the Development will be checked for nesting birds (if works are during the breeding bird season, March August inclusive), before works commence; and • Reptiles: Reptile surveys were conducted in summer 2017 on land to the north of the Site, but no reptiles were recorded, therefore no mitigation will be required. A Mitigation and Enhancement Strategy would be prepared at the reserved matters stage and would include measures to secure a Construction Ecological Management Plan for protection of ecological features at the site during construction; • Secure a Landscape and Ecology Management Plan for the long-term management of the existing, enhanced and newly created ecological features at the Site; and • Secure follow up protected species surveys and secure the design of a detailed mitigation strategy that would be submitted in due course with an EPS licence application, if deemed necessary after the update survey. As no significant effects on biodiversity features have been identified this topic has been scoped out of the ES.
Cultural Heritage	An assessment undertaken in support of the planning application established that there are no designated archaeological assets on the Site. The only designated assets within the surrounding 1km study area are five Grade II Listed Buildings, all of which are screened from the Site by intervening topography, vegetation and buildings. Consequently, there will be no impact on the designated assets or their settings and significance. The assessment has also established that there is one non-designated archaeological asset recorded in within the Site boundary and one located on the north-west boundary, both dating to the Post-Medieval and Modern periods. These include a marl pit on the west side of the Site and a military aircraft crash site that may straddle the boundary of the Site. The crash site, under the Protection of Military Remains Act of 1986^{vii}, cannot be excavated or remains removed without a license from the Central Casualty Section, a part of the Royal Air Force Personnel Management Agency. However, a geophysical survey of the crash site, undertaken as part of this assessment, did not identify any evidence for the presence of a crashed aircraft. Both assets lie within areas that are not proposed for development and, therefore, will not be impacted by the Development. Notwithstanding this, during the course of the planning application process an archaeological Evaluation was carried out on the Site, which identified some Prehistoric features. It was agreed with WCBC that further work would be carried out via planning condition. Further assessment of the effects of the Development on features of cultural heritage interest have been scoped out of the ES.
Landscape and Views	A Landscape and Visual Impact Assessment, submitted with the planning application, has concluded that the effects on landscape features or landscape character as a result of the Development are not significant, with a beneficial effect on landscape features through the introduction of open spaces, trees and mitigation planting along the site boundaries. Potential effects would be confined to the Site itself and the immediate local area. In terms of visual impacts, the Assessment identified that the visual envelope is

Assessment	Scoping Review
	limited to the views from the roads directly bordering the Site. There are transitory views of the Site from short sections of the A534 and A5156 and the roundabout linking these routes. Where views are experienced they generally occur in the context of the existing housing located on the edge of Wrexham. Visual effects for motorists would be moderate – minor adverse upon completion. Upon maturity of the proposed landscape, the effects on the views for motorists, taking in to account the medium-low sensitivity and low magnitude of effect, would be minor adverse, long term and permanent. There are no public rights of way or local footpaths running through the Site. Effects on views from public rights of way running through the surrounding countryside would largely be negligible with some minor adverse effects on one route. There are very few visual receptors and residual visual effects would be no greater than minor adverse. The lack of significant effects on landscape and views has led to this assessment being scoped out of the ES.
Ground Conditions and Contamination	A Ground Conditions assessment, including intrusive investigation, was submitted with the planning application which did not identify any significant contamination risks therefore this topic has been scoped out of the ES.

Assessment Methodology

- 2.3 The technical studies commenced at an early stage in the development process. The findings of these baseline environmental studies have played an important role in the design of the Development by defining the environmental sensitivities, constraints and opportunities associated with the Site.
- 2.4 The technical studies have been undertaken in accordance with current best practice. Specific guidance used is referenced within each of the respective assessment chapters. The majority of assessments involved consultations with statutory and non-statutory bodies, desk-based research, site inspections and surveys, impact prediction and mitigation.
- 2.5 The assessment and conclusions of the ES are based on the description of the Development provided in Chapter 3, description of the construction phase in Chapter 5 and figures accompanying these chapters.

Structure of Technical Chapters

- 2.6 Each technical chapter of the ES (Chapters 6-7) has been set out broadly in line with Table 2.2 below.

Table 2.2: Structure of the Technical Chapters

Heading	Content
Introduction	Each of the technical chapters begins with an introduction providing context to the EIA completed.

Heading	Content
Policy Context	This section includes a summary of policies of relevance to the environmental discipline and explains its purpose in the context of the Development and the ES.
Assessment Methodology	This section describes the method and approach employed in the assessment of likely significant effects, the criteria against which the significance has been evaluated, the sources of information used and any technical difficulties encountered. Relevant legislation is also identified.
Baseline Conditions	This section describes and evaluates the baseline environmental conditions i.e. the current situation and anticipated changes over time assuming the Site remains undeveloped.
Likely Significant Effects	This section identifies the likely significant effects on the environment resulting from the Development during construction and operational phases. A description of the likely significant effects of the Development and an assessment of their predicted significance is provided.
Mitigation Measures	This section describes the measures which would be implemented to mitigate against potential adverse impacts. Where possible, enhancement measures have also been proposed.
Residual Effects	The residual effects, i.e. the remaining effects of the Development assuming implementation of the proposed mitigation measures, have been estimated and presented.
Cumulative Effects	This section considers the cumulative effects of the Development with committed developments identified within the vicinity of the Site. Any likely significant effects on the environment arising in this respect are set out in this section.
Summary	Each technical chapter concludes with a brief summary outlining the potential residual effects for the construction phase (short/medium) and operation (medium/long-term) phase of the Development.

Baseline Conditions

- 2.7 The ES includes a description of the prevailing environmental conditions, the 'Baseline Conditions', against which the likely significant environmental effects of the Development have been assessed. These are taken to be the conditions at the time or immediately prior to the submission of the planning application in 2021. Each technical assessment has also identified the future baseline conditions in the absence of the Development.

Determining Significance

- 2.8 The assessment of impact significance has been undertaken using appropriate national and international quality standards. Where no such standards exist, the judgments that underpin the attribution of significance are described. The guidelines, methods and techniques used in the process of determining significance of effects are contained within each of the technical chapters presented.

Magnitude

- 2.9 The methodology for determining the scale, or magnitude, of effect is set out in Table 2.3 below.

Table 2.3: Methodology for Assessing Magnitude

Magnitude of Impact	Criteria for Assessing Effect
Major	Total loss or major/substantial alteration to key elements/features of the baseline conditions such that the post development character/composition/attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character / composition / attributes of the baseline condition will be similar to the pre-development circumstances/situation.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

Sensitivity

- 2.10 The sensitivity of a receptor is based on the relative importance of the receptor using the scale in Table 2.4 below.

Table 2.4: Methodology for Assessing Sensitivity

Sensitivity	Examples of Receptor
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Moderate	The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, is of low or local importance.

Significance

- 2.11 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be beneficial or adverse. Table 2.5 below shows how magnitude and sensitivity interact to derive effect significance.

Table 2.5: Methodology for Assessing Significance

Magnitude	Sensitivity		
	High	Moderate	Low
Major	Major Adverse/Beneficial	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial
Moderate	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Moderate - Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor Adverse/Beneficial - Negligible
Negligible	Negligible	Negligible	Negligible

- 2.12 The above magnitude and significance criteria have been provided as a guide for technical specialists to assess impact significance. Where discipline specific methodology has been

applied that differs from the generic criteria above, this has been clearly explained within the given chapter under the heading of Assessment Methodology.

Mitigation

2.13 Any adverse environmental effects have been considered for mitigation at the design stage and, where practicable, specific measures have been put forward. Measures have been considered based on the following hierarchy of mitigation:

- Avoidance;
- Reduction;
- Compensation;
- Remediation; and
- Enhancement.

2.14 Where the effectiveness of the mitigation proposed has been considered uncertain, or where it depends upon assumptions of operating procedures, data and/or professional judgement has been introduced to support these assumptions.

2.15 Mitigation recommended during the demolition and construction phase would be set out in the Construction Environmental Management Plan (CEMP) to be agreed with WCBC prior to the commencement of work and implemented throughout the duration of the works.

2.16 Mitigation to be implemented during the operational phase would be secured through planning conditions and obligations.

Cumulative Effects

2.17 A requirement of the EIA Regulations is to assess cumulative effects. Cumulative effects are generally considered to arise from the combination of effects from the Development and from other proposed or permitted schemes in the vicinity, acting together to generate elevated levels of effects. The schemes that have been included as part of the cumulative effects assessment are those set out in Table 2.6.

Table 2.6: Cumulative Schemes

Site and Planning Reference	Description of Development	Approximate Distance from Site
Borras Park Community Primary School P/2020/0475	One Storey and Two Storey Extensions, Refurbishment Works, Associated Parking Areas, Outdoor Recreation and Games Area	800m to the north west
Former Firestone Factory, Bridge Road, Wrexham Industrial Estate P/2013/0671	Outline Planning Application for the construction of a Prison (Maximum Floorspace of 76,370 Sqm Gross External Area) Within A Secure Perimeter Fence Together With Access, Parking, Visitor / Support Building, Energy Centre, Landscaping.	2.5km to the south
Land at Borras Airfield, The Holt Estate, Borras Quarry, Holt Road P/2003/0579	Extension of sand and gravel workings	800m to the north east

Assumptions and Limitations

2.18 The principal assumptions that have been made and any limitations that have been identified in preparing the ES are set out in each technical chapter. General assumptions include the following:

- Assessments assume the baseline conditions at the time of ES preparation (2021) unless otherwise stated in the technical chapter;
- It is assumed that current surrounding land uses do not change, with the exception of the committed and reasonably foreseeable developments identified;
- Assessments are based on published sources of information and primary data collection. Sources are provided as necessary;
- Assessments are based on the description of development set out in Chapter 3 and shown on the parameter plans, and the anticipated construction methodology and programme described in Chapter 5;
- The design, construction and completed stages of the Development will satisfy minimum environmental standards, consistent with contemporary legislation, practice and knowledge;
- Conditions will be attached to the planning permission that will control disturbance during the construction works; and
- Necessary off-site services infrastructure for the Development will be provided by statutory undertakers.

Objectivity

2.19 The technical studies undertaken within the ES have been progressed in a transparent, impartial and unbiased way with equal weight attached, as appropriate, to beneficial and adverse effects. Where possible, this has been based upon quantitative and accepted criteria

together with the use of value judgments and expert interpretations.

- 2.20 The assessment has been explicit in recognising areas of limitation within the ES and any difficulties that have been encountered, including assumptions upon which the assessments are based. Where appropriate, the assessment of significance has been given confidence levels.

REFERENCES

- ⁱ <https://iaqm.co.uk/guidance/>
- ⁱⁱ <https://gov.wales/technical-advice-note-tan-11-noise>
- ⁱⁱⁱ BS 8233:2014, Guidance on sound insulation and noise reduction for buildings, February 2014
- ^{iv} <https://www.euro.who.int/en/health-topics/environment-and-health/noise/environmental-noise-guidelines-for-the-european-region>
- ^v <https://gov.wales/technical-advice-note-tan-15-development-and-flood-risk>
- ^{vi} <https://theilp.org.uk/publication/guidance-note-1-for-the-reduction-of-obtrusive-light-2020/>
- ^{vii} <https://www.legislation.gov.uk/ukpga/1986/35/contents>