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EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Main Text**

02-09-2026

Document ref: 2026UK550445-ENV-001



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**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 1: Introduction**

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1. Introduction

1.1 Background

- 1.1.1 Essar Energy Transition Fuels (EET Fuels) (hereafter referred to as ‘the Applicant’) is committed to creating the United Kingdom’s (UK’s) first low carbon refinery, investing £1.2 billion to lower atmospheric emissions by decarbonising production processes.
- 1.1.2 This commitment aligns with the UK Government’s ten-point plan to help the UK achieve its net zero emission targets by 2050 (HM Government, 2020).
- 1.1.3 EET Fuels owns and operates the Stanlow Manufacturing Complex (SMC), located in Ellesmere Port on the south side of the Mersey Estuary near Liverpool. The SMC is predominantly a refinery, with support services including bulk liquid storage and distribution logistics via road, rail and sea.
- 1.1.4 The SMC covers an area of nearly 600 hectares (ha), and it plays a key part in the national economy, producing over 18% of the UK’s transport fuels and 12% of its jet fuel. Annually, this equates to over 4.4 billion litres of diesel, three billion litres of petrol, and two billion litres of jet fuel, and feedstocks for the chemical and pharmaceutical supply chains.

Hydrogen Ready Combined Heat and Power

- 1.1.5 Power generated by conventional fossil fuels results in emissions of greenhouse gases, including carbon dioxide (CO₂). Hydrogen derived power has a lower emissions footprint than fossil fuels, and by constructing hydrogen ready power generating facilities at the SMC, EET will be able to significantly reduce its carbon emissions arising from the SMC.
- 1.1.6 The Applicant is taking a phased approach to developing low carbon, hydrogen derived power provision for the refinery. A planning application for Phase 1, a 49.5 megawatt (MW) hydrogen ready Combined Heat and Power (CHP) Plant, is currently being determined via the Town and Country Planning Act (TCPA) 1990 system.
- 1.1.7 Separately, Phase 2, a 560MW hydrogen ready CHP plant, hereafter referred to as the Proposed Development, is the subject of this Scoping Report. Both phases are crucial for the decarbonisation of the SMC, enabling the Applicant to decarbonise its operational fuel use by replacing existing fossil-fuelled steam and electricity production facilities with those capable of burning 100% hydrogen.

- 1.1.8 The Proposed Development will consist of hydrogen ready gas turbines paired with hydrogen ready Heat Recovery Steam Generators (HRSGs), steam turbine units, reciprocating gas engines and backup power supply (Battery Energy Storage System (BESS)). Hydrogen readiness in this case means hydrogen (H₂) capable burners and nitrogen oxides (NO_x) abatement.
- 1.1.9 The phases are designed as follows:
- Phase 1: Consisting of the construction and operation of three hydrogen ready gas turbine modules (each capable of producing 16.5MW generating up to a constant output of 49.5MW in total) and heat recovery steam generators. Phase 1 also includes the construction of a permanent access road, additional pipes on existing gantries (to reach tie-ins across the SMC) and ancillary equipment, and demolition of existing redundant infrastructure, which includes the Material Transport and Estate Services Unit Stores and the Jetting Yard. This Scoping report assumes that Phase 1 will be operational prior to completion of construction of Phase 2, but commencement of development for Phase 2 may occur before Phase 1 Commercial Operation Date.
 - Phase 2: Comprising the construction and operation of additional hydrogen ready gas turbines, heat recovery steam generators and steam turbines. The total expected low carbon power generation of the Proposed Development will be 560MW, designed to achieve a firm operating power output of approximately 200MW with a high degree of operational flexibility, availability and redundancy.
- 1.1.10 This Environmental Impact Assessment (EIA) Scoping Report relates to Phase 2, the Proposed Development, only. Phase 1 of the CHP project is included in the assessment of cumulative effects (**Chapter 19: Cumulative Effects**).
- 1.1.11 The land upon which the Proposed Development is to be located is referred to as the 'Site'. A full description of the Site and the Proposed Development is presented in **Chapter 2: The Proposed Development**.
- 1.1.12 The extent of the Site (hereafter referred to as the 'Site Boundary') is currently considered the maximum extent of all potential permanent and temporary works required in the construction and operation of the Proposed Development. This EIA Scoping Report is based on the Site Boundary displayed in **Volume 2, Figure 1.1: Site Location Plan**.
- 1.1.13 The Site Boundary may be refined (but not extended) following further design development, environmental assessment and consultation ahead of submission of the application. The Proposed Development would be positioned adjacent to the Phase 1 CHP facility and occupies a plot size of approximately 67.32ha, the majority of which is within the SMC.

Other Developments at the SMC

- 1.1.14 The Applicant is making significant investments in other developments over the coming years to reduce emissions at the SMC by the decarbonisation of production processes. There are several other developments planned within the SMC to meet the energy requirements for ongoing and future operations, none of which the Proposed Development relies upon for its operational needs. These contribute towards the Applicant's wider decarbonisation commitment and to help the UK achieve its net zero emission targets by 2050 (HM Government, 2020).
- 1.1.15 The other developments will be undertaken within the SMC as a series of independent programmes and subject to individualised consenting routes. Individual Planning Statements will be submitted in support of the future planning applications, which will provide further information regarding the consenting routes and programmes for each of these developments. These developments include those listed in **Table 1.1** below.

Table 1.1 Developments within the SMC

Project	Outline of Project	Stage
CHP Phase 1	Hydrogen Ready Modular Combined Heat and Power Facility, consisting of 3 modules each comprising a Hydrogen Ready Gas turbine.	Town and Country Planning Act 1990 application submitted in December 2025 and currently pending determination in 2026.
CHP Phase 2 (the Proposed Development)	Gas turbines and steam generators to be constructed and operated, as described in paragraph 1.1.9 .	Pre-application (Scoping Report in progress).
Hydrogen Production Plant (HPP) 1	A HPP to supply the SMC and wider Hynet cluster.	TCPA approved with 21/04091/FUL July 2024.
HPP2	An additional HPP in addition to HPP1 with up to 1000MW (200,000Nm ³ /h) capacity for hydrogen production supplying the SMC and wider Hynet cluster.	Outline planning approved with HPP1 21/04091/FUL.
Private wire (electrical connection) to Encirc	Private wire routing to connect the south CHP plot to the back-up generation and to the edge of SMC for local customers.	Town and Country Planning Act 1990 application (not yet commenced).

Project	Outline of Project	Stage
Sustainable Aviation Fuel (SAF)	Conversion of methanol to sustainable aviation fuel for export to airports.	Town and Country Planning Act 1990 application (not yet commenced).

- 1.1.16 The spatial relationship of CHP Phase 1, CHP Phase 2, and the HPP are presented in **Volume 2, Figure 1.2: Stanlow Project Boundaries**.

1.2 Purpose of the Report

- 1.2.1 The purpose of this EIA Scoping Report – to be submitted to the Planning Inspectorate for a Scoping Opinion on behalf of the Secretary of State – is to establish the scope of the EIA for the Proposed Development. This is to ensure that the subsequent Environmental Statement (ES) focuses on those impacts that are likely to give rise to significant effects as a result of the Proposed Development, and to inform the decision making process carried out by the Examining Authority and the Secretary of State (and statutory consultees) on the proposed EIA approach and scope.
- 1.2.2 This EIA Scoping Report also identifies and ‘scopes out’ potential impacts that are not considered necessary to assess further on the basis that these are not likely to give rise to significant effects. This approach is in line with the general aim to undertake proportionate EIA, as advocated by Institute of Sustainability and Environmental Professionals (ISEP), formerly the Institute of Environmental Management and Assessment (IEMA) guidance on *Delivering Proportionate EIA* (IEMA, 2017).
- 1.2.3 Under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (“the Regulations”), the Scoping Report is submitted to the Planning Inspectorate as a request for a formal written opinion, the ‘Scoping Opinion’.
- 1.2.4 The EIA Regulations (Regulation 10(3)) prescribe the information that a request for an EIA Scoping Opinion must include. **Table 1.2** below provides a breakdown of this information required, and where this information is located in this EIA Scoping Report.

Table 1.2 Information required to accompany a request for a Scoping Opinion

Information Required	Location within this EIA Scoping Report
A plan sufficient to identify the land.	Figure 1.1: Site Location Plan (Volume 2).
A description of the nature and purpose of the development, including its location and technical capacity.	Chapter 2: The Proposed Development.
An explanation of the likely significant effects of the development on the environment.	Chapter 5: Air Quality – Chapter 19: Cumulative Effects.

- 1.2.5 This EIA Scoping Report seeks to establish the overall framework for the EIA in relation to the environmental topics and associated likely significant effects. However, the exact scope of the EIA will be influenced by the Scoping Opinion (prepared by the Planning Inspectorate and key stakeholders); the design evolution of the Proposed Development; the on-going baseline data collection (for example, desk-based studies and field surveys etc); and the consultation to be undertaken with a range of statutory and non-statutory consultees.

1.3 EIA Legislation, Guidance and Process

Definition of Environmental Impact Assessment

- 1.3.1 The term EIA describes a procedure that must be followed for certain types of developments before they can be granted 'consent'. The procedure is a means of identifying, consulting upon and assessing a development's likely significant environmental effects. This helps to ensure that the importance of the predicted effects and the scope for avoiding, preventing, reducing or, if possible, offsetting them are properly understood by the public and the authority granting consent before it makes its decision.

Requirement for an EIA

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

- 1.3.2 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') require that, prior to planning permission being granted, for certain types of development, an EIA must be undertaken. The EIA Regulations set out the types of development that require an EIA (referred to as 'Schedule 1 development') and other developments that may require an assessment if they give rise to potentially significant effects (referred to as 'Schedule 2 development').

- 1.3.3 It is considered that the Proposed Development would qualify under Schedule 2, paragraph 3(a) *“Industrial installations for the production of electricity, steam and hot water”* under the EIA Regulations as the footprint for Phase 2 exceeds 0.5ha.
- 1.3.4 Regulation 5(2) states that the EIA *“must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development”*. This requires the EIA assessment to consider population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and landscape.
- 1.3.5 Regulation 5(4) also requires the EIA to include, where relevant, *“the expected significant effects arising from the vulnerability of the Project to major accidents or disasters that are relevant to that development”*.

Planning Act 2008

- 1.3.6 Within the Planning Act 2008, Section 14 of Part 3 defines which major infrastructure projects constitute Nationally Significant Infrastructure Projects (NSIPs). The Proposed Development will comprise the construction of a generating station under section 14 (1) and as per section 15 the Proposed Development is:
- “(2) A generating station is within this subsection if:*
- (a) it is in England (aa) it does not generate electricity from offshore wind;*
- (b) it is not an offshore generating station; and*
- (c) its capacity is more than 50 megawatts.”*
- 1.3.7 Therefore, the Proposed Development qualifies as an NSIP. As required by section 31 of the Planning Act 2008, a Development Consent Order (DCO) application will be submitted to the relevant Secretary of State under Part 4 of the Planning Act 2008.

Consenting Relationship between Phases 1 and 2

- 1.3.8 At the time of preparing the EIA Scoping Report, the planning application (25/03828/FUL) for the CHP Phase 1 remains undetermined. Accordingly, several pieces of infrastructure that will be utilised by both Phases of the CHP development (but which are also needed independent of one another) are currently identified and have been considered within the Scoping Report.
- 1.3.9 Should planning permission for Phase 1 be granted, and those shared infrastructure elements secured through that permission, it is anticipated that the equivalent works would be removed from the Phase 2 consent application together with any associated assessment within the ES where no longer required.

- 1.3.10 The ES would therefore be updated prior to submission to reflect the prevailing consenting position and to ensure that only those works requiring authorisation through the Planning Act 2008 regime are included.
- 1.3.11 The final DCO application will clearly identify the infrastructure to be authorised under each consenting regime and will explain the relationship between the TCPA and DCO proposals. The ES will assess the appropriate baseline and cumulative effects arising from the combined operation of Phases 1 and 2, ensuring all environmental effects are fully understood whilst avoiding duplication of assessment or consent.

1.4 EIA Scoping

- 1.4.1 The EIA Scoping stage is an important step in the EIA process, leading to the preparation of a comprehensive EIA to be reported in an ES. The ES will report the likely impacts of the Proposed Development, the recommended design, mitigation and enhancement measures and present the assessment of likely significant (beneficial and adverse, direct and indirect, and cumulative) residual effects arising during the construction and operational phases of the Proposed Development.
- 1.4.2 The main objectives of this EIA Scoping Report are to:
- set out the overall approach to the EIA;
 - identify the environmental topics and elements to be assessed in the ES;
 - identify any topics or elements that do not need to be assessed i.e. can be scoped out;
 - define the technical, spatial and temporal scope of individual assessments;
 - define the methodologies to be used for any baseline surveys;
 - define the methodologies to be used for predicting environmental impacts and evaluating their significance;
 - set out the general approach for incorporating mitigation into the Proposed Development, whether it is through modifications to the design or the addition of other environmental or sustainability measures; and
 - seek any additional information from stakeholders relating to the points above.
- 1.4.3 The EIA Scoping Report is based on the current design of the Proposed Development, as set out within **Chapter 2: The Proposed Development**.
- 1.4.4 In accordance with Regulation 18(4) of the EIA Regulations, the ES will be informed by the Scoping Opinion provided by the Planning Inspectorate and relevant stakeholders in response to this request.

- 1.4.5 Should the design of the Proposed Development change significantly in the interim and be 'materially different' from that described within **Chapter 2: The Proposed Development**, a further request for a Scoping Opinion will be made.

1.5 EIA Scoping Report structure

- 1.5.1 This EIA Scoping Report comprises three volumes that contain the following content:

Volume 1: Scoping Report chapters

- **Chapter 1: Introduction**
Introduces the Proposed Development, its legislative and regulatory context, and the purpose of the Scoping Report.
- **Chapter 2: The Proposed Development**
Describes the key design components and construction activities for the Proposed Development.
- **Chapter 3: Approach to EIA**
Describes the EIA methodology, the engagement that has informed the scope of the EIA, and the alternatives considered as part of the design evolution.
- **Chapter 4: Environmental Topics Scoped Out of the EIA** summarises the environmental topics proposed to be scoped out of the EIA.

Technical chapters as follows:

- **Chapter 5: Air Quality;**
- **Chapter 6: Noise and Vibration;**
- **Chapter 7: Biodiversity;**
- **Chapter 8: Cultural Heritage;**
- **Chapter 9: Landscape and Visual;**
- **Chapter 10: Water Environment and Flood Risk;**
- **Chapter 11: Climate Resilience;**
- **Chapter 12: Greenhouse Gases;**
- **Chapter 13: Socio-economics;**
- **Chapter 14: Population and Human Health;**
- **Chapter 15: Materials and Waste;**
- **Chapter 16: Ground Conditions and Soils;**
- **Chapter 17: Transport and Movement;**
- **Chapter 18: Major Accidents and Disasters; and**
- **Chapter 19: Cumulative Effects.**

Volume 2: Figures

- Figures that present spatial data that has been used to inform the Scoping Report chapters.

Volume 3: Appendices

- Appendices that support and relate to the technical chapters, and that are referenced throughout. This includes a glossary and list of abbreviations.

References

HM Government, (2020). *The Ten Point Plan for a Green Industrial Revolution*. Available online at: <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution> (Accessed: February 2026).

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EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 2: The Proposed Development**

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2. The Proposed Development

2.1 Overview

- 2.1.1 This chapter describes the need for the Proposed Development, its objectives, and a description of the key proposed infrastructure components.
- 2.1.2 It also describes the main activities that will be undertaken during the construction, operation and maintenance of the Proposed Development, with an indication of the anticipated programme for these activities.
- 2.1.3 The future decommissioning of the Proposed Development at the end of its operational life is described briefly.
- 2.1.4 Relevant information regarding the area surrounding the Stanlow Manufacturing Complex (SMC) is included in this chapter.
- 2.1.5 The information provided in this chapter has been used as the basis for the scoping of the technical chapters **Chapter 5: Air Quality – Chapter 19: Cumulative Effects**. The information will be updated at the Environmental Statement (ES) stage as the project design evolves and in response to the Scoping Opinion where relevant.
- 2.1.6 The design of the Proposed Development incorporates a necessary degree of flexibility in the choice of technology, to allow for the future selection of the preferred technology in the light of prevailing policy and market conditions once a Development Consent Order (DCO) is granted. A Rochdale Envelope approach is required, to allow the Applicant to retain necessary flexibility to allow different equipment and construction approaches to be selected at a later date. Where this is relevant to the assessments in the ES it will be explained fully, in the description of the Proposed Development or in relevant topic chapters.

2.2 Need for the Project

- 2.2.1 Essar Energy Transition Fuels (EET Fuels) (the Applicant) owns and operates the SMC. The SMC covers an area of 600 hectares (ha), within which industrial activities include the refinement of hydrocarbons, the production of transport fuels including diesel, petrol, jet fuel, and feedstocks for wider industries.
- 2.2.2 EET plans to develop a low carbon energy hub, including large scale low carbon hydrogen production, installing carbon capture on existing production processes and production of decarbonised transport fuels such as Sustainable Aviation Fuel (SAF).

- 2.2.3 As part of the low carbon energy hub, the Applicant is proposing to construct and operate a Hydrogen Ready Combined Heat and Power (CHP) facility at the SMC, and this is the subject of this Scoping Report.
- 2.2.4 The Proposed Development is crucial for the decarbonisation of the SMC and wider surrounding industries. It will enable the Applicant to decarbonise its existing fuel use by replacing fossil-fuelled steam and electricity production facilities with those capable of burning 100% hydrogen. It will also provide low carbon power to other large energy consuming facilities near the SMC.
- 2.2.5 The Proposed Development aligns with the United Kingdom (UK) Government's ten-point plan to help the United Kingdom achieve its net zero emission targets by 2050 (HM Government, 2020).

2.3 Objectives of the Proposed Development

2.3.1 The Proposed Development will deliver:

- An improvement upon the existing CHP facility by increasing the power supply for industrial uses. This includes the SMC's electrification programme and supplying other local industries. This will allow these facilities to operate efficiently and cost effectively whilst minimising the load on the National Grid, which is a constraint on industrial decarbonisation in the northwest of England.
- Construction of Phase 2 of the UK's first large scale 100% hydrogen ready CHP facility, (with CHP Phase 1 being consented pursuant to an application under the Town and Country Planning Act 1990), providing additional dispatchable low carbon power production.
- Contributes to the UK Government's Clean Power 2030 Action Plan (UK Government, 2024). The design allows for baseload power generation initially, with flexibility to allow renewable power import whilst still generating steam in the long term. This will deploy technology needed to balance the UK's future electricity system with fully decarbonised power.
- A facility designed to operate with cogeneration of heat and power, which will allow the Proposed Development to operate more efficiently than equivalent combined cycle power plants. This improves carbon savings when not operating on hydrogen and makes the most efficient use of the initially limited low carbon hydrogen when the fuel is switched.
- Replacement of elements of the legacy plant at the SMC, improving reliability, safety and environmental performance of the SMC.

2.4 Description of the Proposed Development

Key Components

- 2.4.1 The Proposed Development will produce a total installed electrical capacity of up to 560 megawatts (MW) and be designed to achieve a firm operating power output of 200MW with a high degree of availability and redundancy.
- 2.4.2 The Principal Generating Infrastructure will comprise the following.
- **Gas Turbine (GT) modules:** Up to five modular GT units, each one comprising one hydrogen ready GT producing up to 20MW and one heat-recovery steam generator (up to 2000 tonnes per day 100 Barg steam). Units will be compliant with Best Available Techniques Reference (BATC/BREF) requirements for nitrogen oxide (NOx) emissions with all fuels, including hydrogen.
 - **Heat Recovery Steam Generators (HRSGs):** Up to five HRSGs, each sized to efficiently recover heat from its associated gas turbine (GT) and produce a range of steam and heat outputs, including Very High Pressure (VHP) steam, Low Pressure (LP) steam, and hot water/cold water heating using recovered waste flue gas heat.
 - **HRSG stacks:** Up to two HRSG stacks, which provide the discharge points for treated combustion gases following passage through the HRSGs and associated emissions control equipment.
 - **Steam Turbine Generators (STGs):** Up to six Steam Turbine Units, with a total maximum capacity of 240MW. Each unit will comprise a high-pressure steam turbine with steam extraction points to maximise plant efficiency. The total maximum electrical capacity of the STGs will be up to 240 MW.
- 2.4.3 The Proposed Development may also include back-up/supporting power as follows:
- 120MW of reciprocating gas engines; and
 - 100MW of Battery Energy Storage System (BESS).
- 2.4.4 The back-up and supporting generation infrastructure will support the provision of a stable and resilient electrical network for users, helping to manage changes in electrical load, respond to network disturbances and maintain continuity of supply
- 2.4.5 Operation of the reciprocating gas engines will be subject to the applicable BAT requirements and associated operating limitations.

Associated Components

2.4.6 Installation of the key components will be accompanied by the following as part of the Proposed Development:

- Up to three multifuel fired package boilers with steam raising capacity of up to 4,500 tonnes per day each;
- Steam Interconnection to EET Fuels steam system;
- Hybrid Cooling Tower or Air-Cooled Condenser to support the combined cycle operation;
- Closed Circuit Water Cooler;
- up to 5 x deaerators and up to 10 x Boiler Feedwater Pumps;
- chemical storage including capacity for an additional (2 x 95 tonnes) of ammonia;
- chemical injection packages;
- modularised structural pipe racks;
- modularised E-House (Substations) and Local Electrical Room (LER);
- Associated utilities (including gas mains, water pipes, telecoms cables, electrical cables and drainage) as well as private wire routing to connect the CHP plot to the back-up/supporting generation and to the edge of SMC for local customers. Services may be conveyed above, below or at surface.
- temporary construction laydown area;
- temporary contractors welfare cabins and parking; and
- other ancillary infrastructure required to facilitate construction and operation.

2.4.7 The Proposed Development has been designed to operate flexibly under a range of scenarios and therefore is expected to remain in operation producing low carbon dispatchable power.

Operational Lifespan

2.4.8 The design life of the Proposed Development is 25 years.

Location

2.4.9 The Proposed Development is located within the southern area of the SMC, positioned adjacent to the existing CHP facility. The Red Line Boundary occupies a plot size of 67.32ha, the majority of which falls within the SMC. The location of

the Proposed Development is shown in **Volume 2, Figure 1.1: Site Location Plan**.

- 2.4.10 The land upon which the Proposed Development is to be located is referred to as the 'Site'.
- 2.4.11 The extent of the Proposed Development (hereafter referred to as the 'Site Boundary') is currently considered the maximum extent of all potential permanent and temporary works required in the construction and operation of the Proposed Development. This Scoping Report is based on the Site Boundary displayed in **Volume 2, Figure 1.1: Site Location Plan**. The Site Boundary may be refined following further design development, environmental assessment and consultation, and the Scoping Opinion ahead of submission of the application.

Existing Infrastructure

- 2.4.12 The Site is currently occupied by a number of redundant buildings, plant and made ground that will require demolition and clearance in advance of construction of the Proposed Development. Structures that may require demolition include:
- EET Fuels current demineralisation plant;
 - EET Fuels current MP boiler house;
 - EET Fuels TENKO building/warehouse;
 - Poly store;
 - Two shelters; and
 - Substation 86.
- 2.4.13 The remaining existing buildings or structures are containers or containerised offices that will be lifted and removed rather than demolished.
- 2.4.14 An Interconnection to the existing refinery systems including power distribution systems will also be included as part of the Proposed Development. Existing boilers will be partially reduced as the Proposed Development is brought into operation, with retained assets used primarily for backup purposes.

Public Rights of Way

- 2.4.15 There are several designated footpaths within 500 metres (m) of the Proposed Development. These are:
- Thornton-le-Moors Footpath (FP) 1 (approximately 200m south of the Red Line Boundary at its closest point);
 - Thornton-le-Moors FP 2 (approximately 220m south of the Red Line Boundary at its closest point);

- Thornton-le-Moors FP 3 (approximately 380m south of the Red Line Boundary at its closest point);
- Elton FP 1 (approximately 7m east of the Red Line Boundary at its closest point); and
- Elton FP 5 (approximately 200m south of the Red Line Boundary at its closest point).

2.4.16 Additionally, the National Cycle Network (NCN) Route 5 is situated immediately to the south of the Site, along the A5117.

2.4.17 **Volume 2, Figure 2.1: Environmental Constraints Plan** displays a selection of the key constraints described here and throughout this Scoping Report.

Surrounding Area

2.4.18 The Site location is entirely within the Thornton-le-Moors Air Quality Management Area (AQMA) No. 4, designated for the pollutant sulphur dioxide (SO₂).

2.4.19 The River Mersey estuary, which includes the Mersey Estuary Special Protected Area (SPA), Ramsar and Site of Special Scientific Interest (SSSI) are located approximately 0.7 kilometres (km) north of the Red Line Boundary at its closest point. The Mersey Estuary SPA is designated for a variety of overwintering birds including Annex I species golden plover, shelduck, teal, pintail, dunlin, black-tailed godwit and redshank. Small areas of deciduous woodland are present on-site.

2.4.20 Gale Brook flows through the Red Line Boundary in a northerly direction. It is a tributary of the River Gow, discharging into the River Gow approximately 80m to the west of the Red Line Boundary at its closest point. Gale Brook is designated as a main river and is under the jurisdiction of the Environment Agency.

2.4.21 The east of the Site is located within Flood Zone 1 (Low Probability of flooding from fluvial and tidal sources), as well as a section towards the south. The west areas of the Site and along the alignment of Gale Brook are shown to be within Flood Zone 2 (Medium Probability of flooding from fluvial and tidal sources) and Flood Zone 3 (High Probability of flooding from fluvial and tidal sources).

2.4.22 The nearest residential settlement is Thornton-le-Moors, located approximately 70m to the south of the Red Line Boundary at Pool Lane. Thornton-le-Moors contains receptors including Hayrack Church Farm Park and Café, St Marys Church, Cheshire Wildlife Trust Holly Bank House, and a number of small businesses. Elton is also present 140m to the east of the Red Line Boundary. Here, receptors include Elton Community Centre, Elton Primary School and Nursery, and Elton Church Hall. An Essar-owned site called Thornton Technology Park (also known as Thornton Science Park and being re-named as Essar Park) is sited between the Site and Elton.

2.5 Construction

Construction Programme and Activities

2.5.1 Construction for the Proposed Development is expected to start in quarter 4 2028 with an estimated 16 month construction programme as detailed in **Table 2.1** below.

Table 2.1 CHP Phase 2 Construction Programme

Construction activities	Timescale
Mobilisation of Appointed Contractor and early works	Months 1-2
Earthworks (demolition, site grading)	Months 3-5
Civil works (piling)	Months 6-9
Installation/Mechanical Completion	Months 14-16
Commissioning	Months 14-18

- 2.5.2 The approach to construction will continually evolve as part of the ongoing design process and assessed accordingly in the ES. Should any optionality remain at the point of submission, each topic chapter will consider the worst case approach for their topic accordingly.
- 2.5.3 Preliminary information indicates that there will be between 50 to 150 people on-site during the construction phase, increasing to 300 people at the peak of activity.

Earthworks

- 2.5.4 For the construction phase, a summary of materials likely to be required or generated as arisings from excavations is provided in **Table 15.4 of Chapter 15: Materials and Waste**. Material types listed there include fill, shuttering, and rubble.

Construction Lighting

- 2.5.5 Temporary lighting will be provided during construction with appropriate controls for the protection of human and ecological receptors.

Temporary Construction Compounds

- 2.5.6 One or more temporary construction compounds will be required. Land will be allocated within the Red Line Boundary for this purpose. These areas will be used during construction for construction offices, workshops, laydown areas, storage, welfare facilities and car parking. The areas will be reinstated to their original use following completion of the construction works for the Proposed Development or utilised for further development at the SMC, described in **Section 2.4**.

Construction Working Hours

- 2.5.7 During construction, it is anticipated that core working hours will be Monday to Friday 08:00 to 18:00. On Saturdays, standard working hours will be 08:00 to 13:00. It is not expected that construction work will be undertaken on Sundays or Bank Holidays.
- 2.5.8 It is likely that some construction activities and deliveries will be required outside of the core working hours. Appropriate controls for these activities will be secured through the DCO requirements and/or a Code of Construction Practice (CoCP).

Construction Delivery and Access

- 2.5.9 It is assumed that the majority of the transport of construction materials for the Proposed Development will be by road. The majority of construction traffic access

will be taken via the main entrance to the SMC on Pool Lane to the east of the Site. Pool Lane connects to the road network by way of the A5117 running to the south of the SMC. The nearest strategic road network connection being the M53 to the west of the SMC. During construction, abnormal loads are anticipated to facilitate delivery of large, prefabricated equipment. A second access to the Site, located on the A5117, will be used for Abnormal Indivisible Loads (AILs) only. This access is located approximately 100m east from the A5117/Thornton Green Lane priority junction.

- 2.5.10 Further information on the surrounding road network can be found in **Chapter 17: Transport and Movement**.

Code of Construction Practice

- 2.5.11 Environmental mitigation required during construction will be recorded in a CoCP. The CoCP will detail the environmental controls, environmental protection measures and safety procedures that will be adopted during construction. This will provide a tool to ensure the successful management of the likely environmental effects as a result of construction activities.

2.6 Operation and Maintenance

Operational Controls

- 2.6.1 The Proposed Development will operate under an Environmental Permit, which will control aspects such as operating emissions limits.

Operational Lighting

- 2.6.2 Operational lighting arrangements are in place for the SMC. It is assumed that any new lighting in association with the Proposed Development will comply with the same design standards.

Maintenance Requirements

- 2.6.3 Maintenance of the Proposed Development would be the responsibility of the Applicant, and would involve routine planned maintenance and system checks, as well as reactive maintenance and repairs.

Site Staff

- 2.6.4 Whilst staff would be required for operation and maintenance of the Proposed Development, the proposed phased retirement of the existing CHP facility will mean that the number of site staff is not anticipated to change.

2.7 Decommissioning

- 2.7.1 The Proposed Development is anticipated to operate for a minimum of 25 years. At the end of the 25 year period, the Proposed Development may have some residual operational life remaining and a decision will be made as to whether to extend the operational life of the Proposed Development which may continue to operate beyond this period following maintenance and refurbishment.
- 2.7.2 The impacts associated with decommissioning cannot be robustly assessed at this time; therefore, decommissioning has not been considered in this EIA Scoping Report.

References

HM Government, (2020). *The Ten Point Plan for a Green Industrial Revolution*. Available online at: <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution> (Accessed: March 2026).

UK Government, (2024, updated 2025) *Clean Power 2030 Action Plan*. Available online at: <https://www.gov.uk/government/publications/clean-power-2030-action-plan> (Accessed: June 2026).



PUBLIC

EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 3: Approach to EIA**

02-09-2026

Document ref: 2026UK550445-ENV-001



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3. Approach to EIA

3.1 Introduction

- 3.1.1 This chapter presents the overall approach to the Environmental Impact Assessment (EIA) for the Proposed Development. A detailed overview of the assessment methodology adopted for each environmental topic is provided within the respective chapters of this EIA Scoping Report. The approach to the assessment has been informed by current best practice guidance issued by the Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management and Assessment (IEMA)) (ISEP, 2024).
- 3.1.2 The Environmental Statement (ES) will contain the information specified in both Regulation 14(2)(a-f) and Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations) and as set out below:
- (a) a description of the proposed development comprising information on the site, design, size and other relevant features of the development;
 - (b) a description of the likely significant effects of the proposed development on the environment;
 - (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;
 - (d) a description of the reasonable alternatives studied by the applicant, which are relevant to the 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;
 - (e) a non-technical summary of the information referred to in sub-paragraphs (a) to (d); and
 - (f) any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.
- 3.1.3 The ES will set out the process followed during the EIA including the methods used for the collection of data and for the identification and assessment of impacts. Any assumptions made will be clearly identified.
- 3.1.4 In line with Regulation 14(4) of the EIA Regulations, the EIA will be undertaken by a suitably qualified team and the qualifications and experience of the team will be set out in the ES. ISEP has awarded WSP the EIA Quality Mark in recognition of

commitment to excellence in EIA activities. WSP has continued to maintain this following annual examination in relation to its products, staff, innovation, and promotion of EIA within the industry.

3.2 Consultation

- 3.2.1 The Planning and Infrastructure Act 2025 (PIA) removes the statutory pre-application consultation requirements in sections 42, 43, 44, 45, 47 and 49 of the Planning Act 2008 (the 2008 Act), including the requirement for a Preliminary Environmental Information Report (PEIR) and related provisions. Importantly, the common law duty to consult is unaffected and continues to apply.
- 3.2.2 The PIA introduces a new duty on the Secretary of State to publish best practice guidance under section 50 of the 2008 Act to assist applicants in preparing applications that are ready for submission and able to proceed to examination.
- 3.2.3 Pre-application consultation remains a crucial part of the Development Consent Order (DCO) process, both as a matter of law and process and the Applicant will fully comply with the best practice guidance and importantly, will comply with the common law principles applicable to public consultations, (the “Gunning” principles) i.e.:
- Consultations must take place when proposals are at a sufficiently formative stage, and hence open to change. Applicants must be demonstrably open minded.
 - Consultees must be given sufficient information, including environmental information, and rationale to permit intelligent consideration and response.
 - Adequate time must be given for consideration and response.
 - Consultation responses must be considered and taken into account, before the applicant decides what to do.
- 3.2.4 As part of the EIA process, consultation and engagement has been and will continue to be undertaken with a range of statutory and non-statutory consultees. It is anticipated at this stage that consultees will include, but not be limited to:
- Cheshire West and Chester Council;
 - Environment Agency;
 - Health and Safety Executive;
 - Historic England;
 - Lead Local Flood Authority;
 - Liverpool City Region Combined Authority;

- National Highways; and
- Natural England.

- 3.2.5 The purpose of this consultation and engagement is to brief consultees on the Proposed Development, seek feedback on the approach to assessment, and obtain baseline data. The process of consultation is critical to the development of a comprehensive and balanced ES. The views of statutory and non-statutory consultees serve to focus the environmental studies and to identify specific issues that require further investigation.
- 3.2.6 Consultation for Scoping is expected to take place in Q3 2026, and for the ES from Q2 2027. Non-statutory community stakeholder engagement briefings will be held in October to November 2026 to introduce stakeholders and local communities to the Proposed Development and give them an opportunity to share their views.
- 3.2.7 Stakeholder engagement for the Proposed Development is outlined in **Table 3.1**. This relates to Phase 2 of the Combined Heat and Power (CHP) project only, as described in **Chapter 1: Introduction**.

Table 3.1 Environment stakeholder engagement undertaken to date for the Proposed Development

Engagement Type	Stakeholder	Agenda/Topics	Date
Introductory Briefing Session	Environment Agency	■ overview of CHP; ■ Phase 2: Programme (key milestones); ■ Phase 2: cost recovery; and ■ Phase 1: EA response.	05 March 2026
Written Correspondence	National Highways	■ Cost Recovery letter reissued to EET.	11 March 2026
Introductory Briefing Session	Health and Safety Executive	■ overview of EET and the Stanlow site; ■ overview of CHP Phase 2 Project; ■ indicative timeline to DCO application; and ■ working together.	01 April 2026
Written Correspondence	Historic England (HE)	HE could not attend introductory briefing. A slide deck with the following information was distributed to HE:	08 April 2026

Engagement Type	Stakeholder	Agenda/Topics	Date
		■ overview of EET and the Stanlow site; ■ overview of CHP Phase 2 Project; ■ indicative timeline to DCO application; ■ working together; and ■ cost recovery quote requested (reminder emails sent 29 April 2026 and 11 May 2026).	
Introductory Briefing Session	Natural England	■ overview of EET and the Stanlow site; ■ overview of CHP Phase 2 Project; ■ indicative timeline to DCO application; and ■ working together.	21 April 2026
Introductory Briefing Session	National Highways	■ overview of EET and the Stanlow site; ■ overview of CHP Phase 2 Project; ■ indicative timeline to application; and ■ working together.	21 May 2026

3.2.8 Technical engagement will continue throughout the EIA process. A summary of the engagement activities with relevant consultees will be included within the ES and technical consultation will be summarised within each relevant chapter. All responses received during consultation will be carefully considered and taken into account in the development of the project. Details of any responses received during consultation and the account taken of those responses will be included within the ES, or DCO application, as appropriate.

3.2.9 Under Regulation 10(6) of the EIA Regulations, the Secretary of State must undertake consultation with statutory consultation bodies, including environmental bodies and relevant planning authorities before adopting a Scoping Opinion.

Phase 1 Stakeholder Engagement

- 3.2.10 The Applicant has undertaken engagement on Phase 1 with a range of stakeholders. Relevant aspects of this engagement have been taken forward into identifying constraints and the scope of the EIA for Phase 2.

3.3 Assessment of the Proposed Development

Defining the Study Area

- 3.3.1 The proposed Study Area for each environmental topic is set out within **Chapter 5: Air Quality – Chapter 19: Cumulative Effects** of this EIA Scoping Report.

Establishing Baseline Conditions

- 3.3.2 The baseline environment includes the existing environmental characteristics and conditions based on surveys undertaken and information available at the time of the assessment.
- 3.3.3 Baseline conditions will be established by:
- site visits and surveys;
 - desk-based studies; and
 - modelling.
- 3.3.4 The baseline conditions for each environmental factor as currently understood are set out within the respective chapters of this EIA Scoping Report (see **Chapter 5: Air Quality – Chapter 19: Cumulative Effects**).
- 3.3.5 The baseline conditions used in the ES will vary depending on the timing of surveys or the date at which data sources have been produced/assessed. It is anticipated that information required to inform the baseline environment for the assessments will be based on data obtained or surveys being undertaken in 2026. Existing baseline data collected prior to this may be used to inform the assessment if it is deemed to remain relevant.
- 3.3.6 Data obtained from third party sources may be older, but the origin of all third party data will be clearly outlined, alongside any limitations and assumptions.
- 3.3.7 The period of validity for each set of baseline data collected will be set out in the ES and where appropriate, the requirement for any repeat surveys will be specified, for example, species data.

- 3.3.8 In order to collect baseline data, it may be necessary to collect data on the Site or from nearby third party land. Where it is not possible to access third party private land, data will be collected from publicly accessible land only.

Establishing Future Baseline Conditions

- 3.3.9 The future baseline is the description of the likely evolution of the baseline scenario, without the implementation of the Proposed Development. This EIA Scoping Report will take account of readily available information and scientific knowledge to provide a description of the natural changes in the local environment over an appropriate timescale that the datasets support, to enable the assessment of the Proposed Development's impact on the future baseline.

Consideration of Alternatives

- 3.3.10 Regulation 14(2) (d) of the EIA Regulations states that an ES should include:
- “a description of the reasonable alternatives studied by the applicant, which are relevant to the 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.”*
- 3.3.11 As part of the iterative design process, the Proposed Development will continue to evolve to take account of matters such as environmental constraints and opportunities. This will be recorded within the ES as embedded mitigation.
- 3.3.12 The ES will also consider the ‘do nothing’ scenario, i.e. the missed opportunities or avoidance of Likely Significant Effects (LSEs) associated with the Proposed Development.

Scenario Assessments

- 3.3.13 The following scenarios will be assessed:
- construction effects: associated with the construction activities required for the Proposed Development (worst-case scenario based on peak construction activity, including enabling and demolition works);
 - operational effects: associated with the operation of the Proposed Development following completion of construction, including an assessment of ongoing maintenance of the Proposed Development; and
 - cumulative effects: arising during either construction or operation, when the effects of the Proposed Development are considered with other development.

Likely Significant Effects

- 3.3.14 LSEs will be described in the ES in relation to the extent of changes to the existing baseline and future baseline environment as a result of the construction, operation and/or decommissioning of the Proposed Development. Each ES Chapter will identify the likely impacts resulting from the Proposed Development. The magnitude of impacts is defined with reference to the relevant baseline conditions (existing or future, as appropriate), and the value of the receptor or receiving environment. The environmental effects are determined in accordance with the identified methodology.
- 3.3.15 Impacts will be considered on the basis of their magnitude, duration and reversibility. Cumulative and combined effects will also be considered where appropriate. Significance will be evaluated on the basis of the scale of the impact and the importance or sensitivity of the receptors, in accordance with standard assessment methodologies (major, moderate, minor and negligible). For the purpose of the EIA, moderate and major effects will be deemed 'significant'. Where likely significant environmental effects are identified in the assessment process, measures to mitigate these effects will be put forward in the form of recommendations to be undertaken as part of the project development.
- 3.3.16 The following criteria have been taken into account when determining the significance of the potential effects:
- relevant legislation and planning policy;
 - international, national, regional and local standards;
 - likelihood of occurrence;
 - geographical extent;
 - sensitivity of the affected resource or receptor;
 - value of the affected resource or receptor;
 - magnitude and complexity of effect;
 - whether the effect is temporary or permanent;
 - whether the effect is short, medium or long-term in duration;
 - whether the effect is reversible or irreversible;
 - inter-relationship between different effects (both cumulatively and in terms of potential effect interactions); and
 - the outcomes of consultations.

- 3.3.17 In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between effects upon different environmental components, the following terminology will be used throughout the ES to define effects:
- “Beneficial, Negligible or Adverse” significance or “No Impact / Effect”:
 - adverse – detrimental or negative effect to an environmental resource or receptor;
 - beneficial – advantageous or positive effect to an environmental resource or receptor; and
 - negligible – imperceptible effect to an environmental resource or receptor.
 - for effects described as Beneficial or Adverse, define significance level as “Minor, Moderate or Major”:
 - minor – slight, very short or highly localised effect of no significant consequence;
 - moderate – more than a slight, very short or localised effect (by extent, duration or magnitude) which may be considered significant; and
 - major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

3.3.18 Effects that are considered to be significant prior to additional mitigation, will be identified in the ES. The overall significance of effects presented in this EIA Scoping Report is derived from the magnitude of change and the sensitivity of the receptor, as shown in **Table 3.2** below. Unless stated otherwise in the topic chapters, this approach to assessing significance is applied to the assessment presented in the ES.

Table 3.2 Significance of effects matrix

	Magnitude of Impact (Degree of Change)				
Environmental Value (Sensitivity)		High	Medium	Low	Very low
	High	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Negligible	Negligible

	Magnitude of Impact (Degree of Change)				
	Very low	Minor	Negligible	Negligible	Negligible

- 3.3.19 In general, a high, major or moderate effect is considered to be significant in EIA terms.
- 3.3.20 Best practice and guidance require that certain technical disciplines must follow topic-specific criteria for determining significance. Where this is the case, the criteria will be established in the methodology section of each environmental topic within **Chapter 5: Air Quality – Chapter 19: Cumulative Effects** of this EIA Scoping Report. For the topics in which there is no such guidance, the effects have been identified using professional judgement.

Approach to Mitigation

- 3.3.21 The ES will consider mitigation in accordance with ISEP guidance (ISEP, 2024) relating to primary, secondary and tertiary mitigation measures.
- 3.3.22 In accordance with these guidance documents, three types of mitigation will be identified and used within this EIA Scoping Report:
- **Primary mitigation** – modifications to the location or design during the pre-application phase that are integral to the Proposed Development.
 - **Secondary mitigation** – actions that will require further activity to achieve the anticipated outcome and which shall adhere to the standard mitigation hierarchy (i.e. avoidance, reduction and compensation).
 - **Tertiary mitigation** – actions that would occur with or without input from the EIA. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are standard to meet other existing legislative requirements.
- 3.3.23 Primary and tertiary mitigation is referred to as ‘embedded mitigation’ because they form an inherent part of the design of the Proposed Development. The assessment of the LSEs for the pre-mitigation scenario takes embedded mitigation into account in determining the magnitude of change.
- 3.3.24 Following the identification and assessment of LSEs during the EIA process, any additional mitigation measures considered necessary will be described within the Environmental Statement. These measures will be developed to further reduce adverse effects or enhance beneficial effects, where appropriate.
- 3.3.25 A summary of the currently proposed design embedded mitigation is included in **Chapter 2: The Proposed Development** of this EIA Scoping Report. This will be

further developed as required by the output of the LSE assessment and reported upon further in the ES. The additional mitigation for each topic will be recorded in the summary chapter of the ES.

Assessment of Likely Significant Residual Effects

- 3.3.26 A residual effect is defined as an effect that remains after the implementation of mitigation measures. Following the identification of design (embedded) mitigation and enhancement measures for each of the identified potential impacts for each environmental topic, consideration is given as to whether potential impacts can be prevented, reduced or remedied so as not to result in a potential significant residual effect.
- 3.3.27 A preliminary assessment of the likely significant residual effects for each of the scoped in technical topics is presented in **Chapter 5: Air Quality – Chapter 19: Cumulative Effects** of this EIA Scoping Report and has taken into account a number of criteria to determine whether or not the likely effects are ‘significant’. Wherever possible and appropriate, the effects have been assessed quantitatively.

Enhancement Measures

- 3.3.28 Where possible, opportunities will be identified to provide environmental enhancement measures as part of the design process within the relevant environmental topics and reported in the ES. These measures are ‘over and above’ mitigation measures and will not be taken into account when determining the significance of effects. Identification of these enhancement measures and how these are assessed are detailed within each environmental topic.

Monitoring

- 3.3.29 The EIA Regulations require, where appropriate, the monitoring of potential significant adverse effects. Where monitoring arrangements are proposed as part of the proposed mitigation, this will be detailed within the relevant topic chapter of the ES. The results of any monitoring will be shared with the relevant organisations, where applicable.

Assessment of Transboundary Impacts

- 3.3.30 Regulation 32 of the EIA Regulations sets out the procedural requirements where a project is likely to have significant environmental effects in a European Economic Area (EEA) State, or where an EEA State considers that its environment is likely to be significantly affected by such a project.

- 3.3.31 The Applicant considers that transboundary impacts will not occur in relation to most environmental topics. This is due to the localised physical nature of the works, that most effects are limited to receptors within the United Kingdom (UK), and given that most emissions are unlikely to travel to any other EEA state from the Site Boundary.
- 3.3.32 However, the Applicant has reviewed the Greenhouse Gases (GHG) topic in terms of potential for transboundary effects on other EEA States for the Proposed Development. With respect to the GHG topic, any GHG emissions have an impact on the global atmosphere (the environmental receptor), no matter the location of the emissions source. Since the environmental receptor for GHG emissions is the global atmosphere, it is not possible to attribute the impact of a potential increase or decrease in GHG emissions from the Proposed Development on a specific country or State.
- 3.3.33 On this basis, it is considered that the assessment of transboundary effects of GHG emissions on the environment of other EEA State(s) is screened out of the EIA. **Chapter 12: Greenhouse Gases** sets out the proposed methodology for determining effects of GHG emissions for the Proposed Development on the global atmosphere.

Coordination of Assessments

- 3.3.34 There are several other associated assessments that will be undertaken to accompany the DCO Application. These are:
- Habitats Regulations Assessment (HRA) Screening Report and Report to Inform Appropriate Assessment (RIAA), if required;
 - Biodiversity Net Gain (BNG) Assessment;
 - Flood Risk Assessment;
 - Water Framework Directive Assessment; and
 - In-Combination Climate Impact Assessment.
- 3.3.35 These are each described in turn below.

Habitats Regulations Assessment

- 3.3.36 Habitats Regulations Assessment (HRA) considers the potential for LSEs to arise as a result of a plan or project, which may affect the integrity of a site or sites (i.e. Special Areas of Conservation (SAC), Special Protection Areas (SPA) within the national site network and their associated qualifying features. It is also a matter of government policy that sites designated under the Convention on Wetlands of International Importance (commonly known as Ramsar sites), possible/proposed

SACs (pSACs), potential SPAs (pSPAs) are also considered in the same way as SACs, SPAs. The range of sites identified above are considered under the grouped term 'European sites'.

3.3.37 The HRA process can involve up to four stages:

- **Stage 1 - Screening:** This stage identifies the potential for LSE of a project upon a site or sites within the national site network, either alone or 'in combination' with other projects.
- **Stage 2 – Information to Inform Appropriate Assessment:** Where there are LSEs, this stage provides additional information to facilitate the full consideration of the impacts of the project on the integrity of the affected site or sites within the national site network, either alone or 'in combination' with other projects. Consideration of impacts is carried out with respect to the sites' conservation objectives which largely relate to the structure and function of the sites and their qualifying features. Where there are adverse impacts and mitigation is required to address those, full details of mitigation measures that will be implemented will be included and a further assessment of the effects in light of that mitigation will be carried out. A proposed conclusion will be outlined with the aim of the Competent Authority being able to use this information to assist them in carrying out their Appropriate Assessment.
- **Stage 3 - Assessment of Alternative Solutions:** Where adverse effects on the integrity of a site are predicted, this stage examines (whether or not there are) alternative ways of achieving the objectives of the project that avoid adverse impacts on the integrity of the national site network. Projects would only advance to Stage 4 if there are Imperative Reasons of Overriding Public Interest (IROPI).
- **Stage 4 - Assessment Where No Alternative Solutions Exist and Where Adverse Impacts Remain:** If the potential for an adverse effect on site integrity cannot be ruled out, this stage assesses compensatory measures where it is deemed that the project or plan should proceed and where there are IROPI.

3.3.38 The integrity of a site is defined as the coherence of the site's ecological structure and function, across the whole of its area, which enables it to sustain the habitat, complex of habitats and/or populations of species for which the site has been designated (European Commission, 2000). An adverse effect on integrity is likely to be one which prevents the site from making the same contribution to favourable conservation status as it did at the time of designation.

3.3.39 The Precautionary Principle is applied at all stages of the HRA process. In relation to Stage 1: Screening this means that projects where significant effects are considered likely and those where uncertainty exists as to whether significant

effects are likely or will require mitigation, must be subject to Stage 2 (Appropriate Assessment) of the HRA process.

- 3.3.40 The HRA will follow accepted guidance in line with the Planning Act 2008 guidance for Nationally Significant Infrastructure Projects (NSIPs) and Advice Note 10 and will provide the Competent Authority Secretary of State with sufficient information to determine whether the Proposed Development will lead to a LSE upon national site networks.
- 3.3.41 As the conclusions of the assessment of both stages will need to be reflected in the Environmental Statement, the RIAA (if required) will be submitted alongside the Environmental Statement for the Proposed Development.
- 3.3.42 The Mersey Estuary SPA, designated for overwintering golden plover *Pluvialis apricaria*, migratory species: redshank *Tringa totanus*, shelduck *Tadorna tadorna*, teal *Anas crecca*, pintail *Anas acuta*, dunlin *Calidris alpina alpina* and black-tailed godwit *Limosa limosa islandica*) and an internationally important waterbird assemblage, will be the focus of the HRA as well as functionally linked land. The findings of the Natural England Commissioned Report 361 will be referred to using the assumptions that habitats that support at least 0.5% of Great Britain's population or 1,000 or more individuals will be considered functionally linked land. The definition of regular use by significant numbers of birds will use the definition in the Natural England report i.e. for seven or more years since 2010.
- 3.3.43 The assessment will also consider the Mersey Estuary Ramsar site. Other European sites within 10km will also be considered such as River Dee and Bala Lake SAC.
- 3.3.44 Data will be drawn from desk study sources such as British Trust for Ornithology, eBird records and local record centre data and project information gained through other nearby developments such as the Hynet Carbon Dioxide Pipeline DCO.
- 3.3.45 Impact pathways that have the most potential to create LSEs are currently considered to be:
- air quality – increased deposition of dust and other atmospheric pollutants from the demolition of structures/buildings, use of plant, construction equipment and vehicular emissions;
 - consideration of air quality effects during operation and their effects on supporting habitats of SPA/Ramsar qualifying species;
 - noise, vibration and visual disturbance – increased risk of disturbance from demolition and the presence of personnel, machinery and vehicles during construction and operational activities that has potential to disturb qualifying species of the SPA/Ramsar;

- pollution – accidental pollution spill and/or release of sediments due to the nature and location of works; and
- water quality – decreased water quality due to dewatering/runoff; post-construction/operational impacts on water flow regime/quantity, potentially affecting hydrological conditions within a national site network designation.

3.3.46 The RIAA (if required) for the Proposed Development will outline the screening of LSEs and provide further information and assessment to inform appropriate assessment by the Competent Authority if significant effects are likely and if mitigation is required. It is anticipated that through the consultative process of DCO the Competent Authority and their consultees will be consulted to gain their views and to resolve any issues.

Biodiversity Net Gain Assessment

3.3.47 BNG is an approach to development that seeks to ensure habitats are left in a measurably better state than before development. For NSIPs, BNG is being introduced through the Planning Act 2008 regime, as amended by the Environment Act 2021, and will apply through the DCO process. The UK government has confirmed that mandatory BNG will apply to NSIP applications from November 2026, with a 10% biodiversity gain objective to be secured through the relevant biodiversity gain statement.

3.3.48 The Proposed Development will be assessed in the context of the emerging NSIP BNG framework. The BNG assessment will analyse the habitats to be retained, enhanced, created or lost within the Site, and will identify the measures required to achieve the biodiversity gain objective. This will include consideration of on-site habitat retention, enhancement and creation, and, where required, off-site habitat compensation or statutory biodiversity credits.

3.3.49 The approach to BNG will be developed through consultation with relevant stakeholders and key decision-makers, to agree the overall approach to the assessment, including the BNG boundary, baseline assumptions, treatment of temporary and permanent habitat impacts, proposed habitat retention and enhancement measures, and any requirement for off-site compensation. This will help ensure that the BNG assessment is proportionate, transparent and aligned with the requirements of the NSIP consenting process.

3.3.50 The assessment will demonstrate how the Proposed Development has applied the mitigation hierarchy and how biodiversity outcomes have been considered through the design and consenting process. It will identify whether additional habitat compensation is required and set out the anticipated biodiversity benefits resulting from the Proposed Development.

Flood Risk Assessment

- 3.3.51 A Flood Risk Assessment will qualitatively assess the potential implications of the Proposed Development on flood risk to people and property, as well as assessing the potential risk of flooding to the Proposed Development.
- 3.3.52 The scope of the Flood Risk Assessment will be refined once further details of the Proposed Development design and construction methodology are available.

In-Combination Climate Impact Assessment

- 3.3.53 An In-combination Climate Impacts (ICCI) Assessment will be undertaken by assessing how the receptors in the surrounding environment identified through the assessments of each topic are affected by future climate parameters. The ICCI assessment will be presented within the relevant ES topic chapters.
- 3.3.54 The ICCI assessment will identify if any reported effects will be exacerbated or ameliorated by the effects of climate change. It will also assess whether the embedded mitigation measures will continue to be effective considering changes to climate and identify further mitigation where required.

Additional Documentation

- 3.3.55 A number of supporting application documents, which will not form part of the ES but which will be relied upon and referred to within the ES, will be submitted as part of the DCO application. Such documents will be inclusive of but not limited to a Register of Environmental Actions and Commitments, and relevant Environmental Management Plans.

References

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Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 4: Environmental Topics Scoped Out
of the EIA

02-09-2026

Document ref: 2026UK550445-ENV-001



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4. Environmental Topics Scoped Out of the EIA

4.1 Introduction

- 4.1.1 To ensure that the Environmental Statement (ES) is proportionately and appropriately focused on aspects and matters where a likely significant effect may occur, the Scoping process should identify aspects and matters that can be scoped out from the need for further assessment. This is aligned with guidance within with the Nationally Significant Infrastructure Projects – Advice Note Seven from the Planning Inspectorate (Planning Inspectorate, 2025).
- 4.1.2 During the Scoping process for the Proposed Development, the Applicant has reviewed the environmental factors (as listed within Article 3(1) of EU Directive 2014/52/EU1 and transposed into United Kingdom legislation by Regulation 19 and Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) Regulations (2017). It has subsequently taken a view of those for which an assessment as part of the Environmental Impact Assessment (EIA) may not be justified. These are proposed to be excluded from further consideration, or Scoped out of the ES. Topics scoped out from further assessment are set out in **Section 4.2** below.
- 4.1.3 Where a topic is scoped in but specific elements of the topic are scoped out from further assessment, these are described in the relevant topic chapter of this EIA Scoping Report (**Chapter 5: Air Quality – Chapter 19: Cumulative Effects**).

4.2 Environmental Topics Scoped Out of the EIA

Climate Resilience

- 4.2.1 Climate resilience evaluates the resilience of the Proposed Development to climate change impacts, including how the design will consider projected impacts of climate change during the construction and operational phases. Climate projections are used to inform the baseline and outline the anticipated change in climate variables such as temperature, precipitation and wind. For the United Kingdom (UK), climate change is projected to lead to warmer, wetter winters and hotter, drier summers, with an increase in the intensity and frequency of extreme events such as heatwaves, drought, extreme rainfall leading to flash flooding, storms, and wind events.

- 4.2.2 During construction, heatwave events may pose health risks to construction workers or cause overheating of construction equipment. Heavy rainfall and storm events may cause damage and disruption to the construction site.
- 4.2.3 During operation, higher temperatures may expose assets to overheating risks and increase the potential for wildfire events. Decreasing precipitation may cause drought and water shortages, whilst flooding during increased rainfall events may result damage and disruption. High winds and lightning strike can cause damage and power disruption.
- 4.2.4 Climate-related impacts can be mitigated through the implementation of design and operational control measures. During construction, the Outline Code of Construction Practice (Outline CoCP) will include measures to manage and mitigate weather related hazards. The design of assets will consider climate change and include cooling systems, drainage and flood alleviation measures, emergency response plans and monitoring of weather forecasts. In addition, the operation of the Stanlow Manufacturing Complex is managed by a site-wide Climate Change Risk Assessment and Adaptation Plan (WSP, 2024). Once the Proposed Development is operational, it will be subject to the adaptation measures within the plan.
- 4.2.5 Taking into account anticipated climate change trends and mitigating measures applicable to the construction and operation of the Proposed Development, the vulnerability assessment in **Chapter 11: Climate Resilience** has demonstrated that the Proposed Development is of low vulnerability to climate change trends across the asset lifecycle and therefore climate resilience is proposed to be descoped from further assessment.
- 4.2.6 Environmental topics scoped into the ES (**Chapter 5: Air Quality – Chapter 18: Major Accidents and Disasters** excluding **Chapter 8: Cultural Heritage**) will consider how the future climate may affect the findings of their assessment in the form of an In-combination Climate Impacts (ICCI) assessment. The ICCI assessment will be presented within each technical chapter of the ES.

Population and Human Health

- 4.2.7 Population and human health assessment evaluates the effects of the Proposed Development on private property and housing, community land and assets, development land and businesses, agricultural land holdings, Walkers, Cyclists and Horse-riders (WCH) and human health.
- 4.2.8 The baseline has been collected from publicly available sources including Google maps, Cheshire West and Chester Council Local Plan Map, Fingertips Public Health Data, English Indices of Multiple Deprivation, the Official Census, Labour Market Statistics (NOMIS) and Sustrans National Cycle Network Map. The

baseline has identified the principal land associated with the Study Area as industrial with the villages of Elton and Thornton-le-moors located close to the Site. There is no land designated for housing development within the Study Area. Three community assets and two businesses have been identified within the Study Area. Within the Site there is a small parcel of land to the east of Pool Lane which is classified as agricultural land however it is assumed that this would not constitute a loss of active agricultural land and there would be no associated impacts on an agricultural landowner or leaseholder. There is limited agricultural land within the Study Area, most of which lies to the south of the Site in the area surrounding Thornton-le-Moors and some located to the east of the Site in the area surrounding Elton. There are several designated footpaths within the Study Area, many of which provide essential, daily connections for WCH navigating within their local area.

- 4.2.9 Additionally, the age group proportions for both Cheshire West and Chester 011D and Cheshire West and Chester 022C are broadly in line with the local authority as well as regional and national averages. The health of Cheshire West and Chester is in line with or better than the health status at both a regional and national level. The indices of deprivation ranks the Cheshire West and Chester 011D 10,079 and Cheshire West and Chester 022C 9,727, out of the 33,755 Lower Layer Super Output Areas in England. This indicates that the Study Area is within the 30% most deprived neighbourhoods in England.
- 4.2.10 Population and human health presented in **Chapter 14: Population and Human Health** is proposed to be descoped from further assessment. This includes all elements such as private property and housing, community land and assets, development land and businesses, agricultural land holdings, WCH and human health. Due to the constrained nature of the construction works and distance of the Site in relation to key receptors, it is anticipated that effects across all elements will be negligible. Once operational, the Proposed Development is not anticipated to have a significant adverse effect on key receptors, when compared with the baseline conditions of the existing Site.

Assessment of Heat and Radiation

- 4.2.11 Schedule 4 of the EIA Regulations requires consideration of the likely significant effects of the Proposed Development resulting from the emission of heat, light and radiation. However, no significant sources of such emissions are anticipated and as such it is proposed to scope this topic out of the ES.

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Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 5: Air Quality**

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Figure 5.3	Air Quality Monitoring Locations

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Appendix 5.1	Air Quality Monitoring Survey
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5. Air Quality

5.1 Introduction

5.1.1 This chapter considers the potential impacts of the Proposed Development on air quality during the construction and operational phases. It sets out the proposed methodology for the air quality assessment and identifies impacts that can be scoped out of the Environmental Impact Assessment (EIA).

5.1.2 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.

5.2 Consultation and Engagement

5.2.1 There has been no specific consultation carried out in relation to Air Quality for the Phase 2 Proposed Development at the time of writing. Engagement undertaken for Phase 1 of the Combined Heat and Power (CHP) development, which is a precursor to Phase 2, is summarised in **Table 5.1**. Phase 1 comprises a Town and Country Planning Act regime application for the CHP, with determination anticipated later in 2026. The engagement undertaken on Phase 1 to date is relevant to the scoping of Phase 2 as it has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the Phase 2 of the project.

5.2.2 Relevant engagement undertaken more widely in relation to Phase 2 is also included in **Table 5.1**.

5.2.3 It is anticipated that feedback in relation to this topic and the scope of works will be gained as part of the Phase 2 EIA Scoping Opinion, and this will inform the production of the Environmental Statement (ES).

Table 5.1 Consultation and engagement to date

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
Cheshire West and Chester Council (CWCC)	24 January 2025	CWCC agreed with scoping out Non-Road Mobile Machinery (NRMM) emissions during construction of the Phase 1 Proposed Development on human and ecological receptors.

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
CWCC	24 January 2025	CWCC agreed with scoping out road vehicles emissions during operation of the Phase 1 Proposed Development on human and ecological receptors.
CWCC	24 January 2025	CWCC agreed scoping out odour emissions during operation of the Phase 1 Proposed Development on human receptors.
Natural England	24 January 2025	Cumulative and in-combination requirements were set out in the Phase 1 Scoping Opinion. Natural England requested that the following projects should be considered: ■ Encyclis Carbon Capture (CC); ■ Ince Bio Power Facility CC; and ■ Viridor Runcorn CC.
Environment Agency	05 March 2026	Phase 2 Stakeholder Briefing ■ Overview of Combined Heat and Power (CHP) ■ Phase 2: Programme (key milestones) ■ Phase 2: Cost recovery ■ Phase 1: EA response
Natural England	21 April 2026	Phase 2 Introductory Briefing ■ Overview of EET and the Stanlow site ■ Overview of CHP Phase 2 Project ■ Indicative timeline to DCO application ■ Working together

5.3 Guidance

5.3.1 This chapter has considered, and the assessment will continue to consider, the following guidance:

- Institute of Air Quality Management (IAQM). Guidance on the assessment of dust from demolition and construction (2024) (IAQM, 2024);
- Environmental Protection UK ('EPUK') and IAQM Land-Use Planning Guidance (2017) (EPUK and IAQM, 2017);

- IAQM. A guide to the assessment of air quality impacts on designated nature conservation sites (2020) (IAQM, 2020);
- Department for Environment, Food & Rural Affairs (Defra). Local Air Quality Management Technical Guidance (LAQM.TG22) (2022) (Defra, 2022);
- Natural England and Defra: Air pollution and development: advice for local authorities (2025) (Natural England, 2025); and
- Environmental Agency and Defra. Air emissions risk assessment for your environmental permit online guidance (Environmental Agency and Defra, 2016, updated 2025).

5.3.2 All relevant legislation has been considered in the preparation of this chapter. The EIA will also consider all relevant legislation.

5.4 Study Area

5.4.1 The spatial extent of the Study Area for air quality will be determined following guidance provided in the IAQM Construction Dust (IAQM, 2024), EPUK and IAQM Land-Use Planning (EPUK and IAQM, 2017) and Environmental Agency and Defra (Environmental Agency and Defra, 2016, updated 2025) guidelines on air quality assessment.

5.4.2 Regarding the construction phase, the Study Area is limited to a buffer of 250m from the Site Red Line Boundary (see **Volume 2, Figure 5.1: Construction Dust Assessment Study Area**) plus 200 metre (m) corridors either side of roads used by construction traffic. For the operational phase the Study Area is limited to a 10 kilometre (km) buffer from the Site Red Line Boundary (see **Volume 2, Figure 5.2: Operational Phase Study Area**).

Construction Dust Emissions

5.4.3 The Study Area for the assessment of fugitive dust emissions associated with the construction phase will be based on the methodology provided within the IAQM Construction Dust (2024) Guidance (IAQM, 2024), as 250m from the Site and within 50m of the route(s) used by construction vehicles on public highway up to 250m from the Site egress.

Construction/Operational Vehicle Emissions

5.4.4 The extent of the Study Area for traffic impacts during the construction and operational phases will be defined as 200m from the modelled road network, with, in addition, regard to guidance on traffic changes requiring detailed assessment (EPUK and IAQM, 2017).

Operational Plant Emissions

- 5.4.5 The Study Area for the assessment of emissions from the Proposed Development will be as follows:
- 2km from Site Boundary for potential impacts on human receptors;
 - 2km from Site Boundary for potential impacts on ecological sites of local and national importance such as Sites of Special Scientific Interest (SSSI), Local Nature Reserves (LNR), National Nature Reserves (NNR) Local Wildlife Sites (LWS) or ancient woodland (AW); and
 - 10km from Site Boundary for potential impacts on designated ecological sites of international importance (e.g. Special Protection Areas (SPA), Special Area of Conservation (SAC) and Ramsar sites).
- 5.4.6 The precise boundaries of the Study Areas will be refined during the detailed assessment phase, based on site-specific data and the characteristics of the emissions and receptors.

5.5 Baseline Conditions

Existing Baseline

- 5.5.1 Cheshire West and Chester Council (CWCC) has designated four Air Quality Management Areas (AQMAs) within its jurisdiction. The Proposed Development is located within one of these AQMAs, specifically Thornton-le Moors AQMA No. 4. Thornton-le-Moors AQMA was declared in 2016 for the likely exceedance of a 15 minute mean sulphur dioxide (SO₂) Air Quality Standard (AQS) objective, which was likely to be due to emissions from the Stanlow Manufacturing Complex (SMC). This AQMA covers the entire village of Thornton-le-Moors, its surrounding areas, and extends west of the Proposed Development towards Ellesmere Port.
- 5.5.2 Additional AQMAs exist in Ellesmere Port (Whitby Road/Station Road), Frodsham (A56/Fluin Lane), and Chester (city centre), primarily due to annual mean nitrogen dioxide (NO₂) levels exceeding standards, mainly attributed to road traffic.
- 5.5.3 The assessment of baseline conditions for the purpose of scoping is limited to an area within 2km of the Site Red Line Boundary for human health receptors and 10km for ecological receptors. This is sufficient to characterise baseline air quality at the Proposed Development and the roads likely to be affected by development-related traffic.
- 5.5.4 Baseline air quality has been assessed with reference to the following data sources:

- Boundaries of AQMAs (Defra, 2018);
- Background maps from Defra Air Information Resource (UK-AIR) website (Defra, 2020);
- 2025 CWCC Air Quality Annual Status Report (ASR) (CWCC, 2025) and associated monitoring data in the Study Area;
- Defra Multi-Agency Geographic Information for the Countryside (MAGIC) web resource (Defra, 2026); and
- Critical level and load data for identified designated ecological habitats and background nitrogen and acid deposition rates from Air Pollution Information System (APIS) (CEH. APIS, 2024).

5.5.5 **Volume 2, Figure 5.1: Construction Dust Assessment Study Area and Figure 5.2: Operational Phase Study Area** show the existing air quality-related features in proximity to the Site.

Automatic Monitoring

5.5.6 The Thornton-le-Moors continuous monitoring site located approximately 450m southwest of the Proposed Development on Park Road, records concentrations of SO₂ and particulate matter (PM₁₀). The site no longer monitors NO₂, with the last monitored data recorded in 2023. The location of the automatic monitor is presented in **Volume 2, Figure 5.3: Air Quality Monitoring Locations**.

5.5.7 For the most recently reported year, 2024 (CWCC, 2025), the annual mean concentration for PM₁₀ was 11 micrograms per cubic meter (µg/m³). The concentration of NO₂ in 2023 was 10.4µg/m³. For both pollutants, concentrations were well below their AQS objectives (40µg/m³, for both annual mean PM₁₀ and annual mean NO₂). **Table 5.2** presents the annual mean concentrations for these pollutants in the last six years. The data show a downwards trend in both NO₂ and PM₁₀ annual mean concentrations (allowing for the influence of Covid travel restrictions). Between 2019-2024, there were no exceedances of the 1 hour mean AQS for NO₂ (200µg/m³) and there have been no exceedances of the 24 hour mean AQS for PM₁₀ (50µg/m³) since 2020.

Table 5.2 Annual mean concentrations at Thornton-le-Moors

Pollutant	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)					
	2019	2020	2021	2022	2023	2024
NO ₂	13	9	11	11	10	-
PM ₁₀	14	13	13	13	12	11

5.5.8 Between 2020-2024, any exceedances of the 1 hour mean ($350 \mu\text{g}/\text{m}^3$), 24 hour mean ($125 \mu\text{g}/\text{m}^3$) and 15 minute mean ($266 \mu\text{g}/\text{m}^3$) concentrations of SO₂, were below the allowable limits at Thornton-le-Moors. Data from 2024 (CWCC, 2025) (the latest available) reveals 17 exceedances of the 15 minute AQAL for SO₂, primarily attributed to emissions from the SMC; which is below the allowable limit of 35 exceedances allowed per year, as they have been for a period of 6 years to 2024.

Passive Monitoring

5.5.9 CWCC operates a network of passive monitoring sites equipped with diffusion tubes to measure NO₂ levels across the region. Within the Study Area however, there is only one roadside diffusion tube (MUL at 1 Mulberry Close, Elton). This site has available monitoring reports spanning 2019 to 2023, as it was decommissioned in 2024. The highest concentration recorded was in 2019 and measured $16.8 \mu\text{g}/\text{m}^3$, decreasing to $12.2 \mu\text{g}/\text{m}^3$ in 2023, well below the AQAL annual mean objective.

5.5.10 With reference to LAQM.TG22, where an annual mean NO₂ concentration is below $60 \mu\text{g}/\text{m}^3$ it is unlikely that there would be an exceedance of the hourly mean AQAL objective. Consequently, the hourly mean NO₂ concentrations are not likely to have exceeded the hourly mean AQAL objective at the local diffusion tube monitoring location in 2023.

5.5.11 The location of the diffusion tube is presented in **Volume 2, Figure 5.3: Air Quality Monitoring**.

Site Specific Monitoring

5.5.12 A site-specific diffusion tube monitoring survey was undertaken as part of Phase 1 from July 2024 to September 2024 at nine locations along key roads around the Site. The purpose of the survey was to gather data on current NO₂ concentrations to inform the baseline and any potential model verification that might have been required. The survey results were processed in line with Defra Guidance LAQM.TG22 (Defra, 2022). The data collected in 2024 remains relevant to and

valid for the Proposed Development in terms of sample distribution and age of data and no further surveys are necessary.

- 5.5.13 The annualised results at the diffusion tube locations ranged from 15.1 µg/m³ (DT1) to 33.6µg/m³ (DT9). All tubes were located at roadside locations, with DT9 located 1.3m from the CWCC Elton continuous monitor that monitors SO₂. Concentrations across all monitoring locations were below the annual mean NO₂ AQAL. The elevated concentrations at DT9 were representative of concentrations at a busy high street with frequent queues.
- 5.5.14 The locations of the site-specific diffusion tubes are presented in **Volume 2, Figure 5.3: Air Quality Monitoring Locations**.
- 5.5.15 Full details of the monitoring survey methodology and results are presented in **Volume 3, Appendix 5.1: Air Quality Monitoring Survey**.

Sensitive Receptors

Human Health

- 5.5.16 The most vulnerable populations, such as those residing in residential properties, schools, hospitals, and care homes, are considered the most sensitive receptors to local air quality impacts. Additional areas of concern for short term exposure include hotels, pubs, and parks.
- 5.5.17 Commercial establishments are also susceptible to dust generated during construction of the Proposed Development. Furthermore, those using the Public Rights of Way network may experience short term exposure to air pollutants and dust emissions.
- 5.5.18 The closest sensitive receptors to the Proposed Development, potentially affected by dust, vehicle, and stack emissions, are located in Ince (north), Elton (northeast), Thornton-le-Moors (south), and Ellesmere Port (northwest). Non-residential receptors are also present northeast of the Proposed Development within Thornton Technology Park.

Designated Ecological Sites

- 5.5.19 Data on designated ecological sites within the Study Area has been sourced from the Defra MAGIC (Defra, 2026) website.
- 5.5.20 Within 10km of the Site Boundary, there are two ecological sites with international or European designations. The Mersey Estuary SPA and Ramsar, also a SSSI, is located approximately 0.7km north of the Site Red Line Boundary at its closest point and extends further north (although the proposed new combustion plant are considerably further away from the SSSI, at approximately 1.9km). The River Dee

and Bala Lake SAC are located approximately 8.6km south of the Site Red Line Boundary at its closest point.

- 5.5.21 No other SSSIs, LNRs, NNRs or AW were identified within 2km of the Site. However, several LWS are present within this radius, including Hoblane Ponds LWS, Gowy Meadows and Ditches LWS, Station Road Railway Site LWS, Wervin Meadows LWS, Shellway Road Pond South LWS and River Gowy LWS.
- 5.5.22 Further information on these ecological receptors is presented in **Chapter 7: Biodiversity**.

Background Concentrations

Human Health

- 5.5.23 The Defra website (Defra, 2020) publishes estimates of background pollutant concentrations for each 1km grid square across the UK. These estimates are derived through the extrapolation and interpolation of empirical measurements and modelled dispersion of both road traffic and industrial emissions. Within each grid square, the background concentrations comprise contributions from various sources, including roads and industry, located within and around that specific area.
- 5.5.24 **Table 5.3** presents the average annual mean background concentration estimates for 2026 the year 2030, specifically for the Defra background map national grid squares (344500, 375500 and 344500, 374500) that encompass the Site. The maximum concentration out of the two grid squares is presented for each pollutant. The Defra background map show that concentrations of NO_x and NO₂ are expected to reduce in the future with PM concentrations remaining static over the next five years.

Table 5.3 Defra mapped annual mean background concentrations (Defra, 2020)

Pollutant	Background Concentration (µg/m ³)				
	2026	2027	2028	2029	2030
NO _x	14.9	14.6	14.2	13.8	13.5
NO ₂	11.3	11.0	10.8	10.5	10.3
PM ₁₀	11.3	11.2	11.1	11.1	11.0
PM _{2.5}	6.0	6.0	6.0	5.9	5.9
SO ₂ *	5.6	-	-	-	-
*Concentration estimates are the Defra 2001 mapped average, the only dataset for SO ₂ available.					

Ecology

- 5.5.25 **Table 5.4** presents data for the maximum background concentrations and deposition of pollutants (nitrogen oxides (NO_x), SO₂, nitrogen and acid deposition) for sensitive ecological sites within the Study Area. The assessment has used a varying background grid over the area of each designation and therefore the backgrounds presented are the worst case. Critical Levels (CL_e) assumed for SO₂ and NH₃ across all sites were 10 and 3µg/m³ respectively. Nitrogen and acid deposition data are available for short (moorland) and tall (woodland) vegetation. All sensitive ecological sites are considered to have short vegetation, apart from Hoblane Ponds that has mature trees and therefore is considered to have tall vegetation.
- 5.5.26 Nitrogen deposition critical loads (CL) are given as a range and have units of kilograms of nitrogen per hectare per year (kgN/ha/yr). Generally, the lower end of the range should be used as a conservative assessment. The critical loads for acidification are more complicated, in that both the nitrogen and sulphur deposition fluxes must be considered at the same time. Therefore, a critical load function is specified for acidification by APIS, via the use of three critical load parameters:
- CLmaxS — the maximum critical load of sulphur, above which the deposition of sulphur alone would be considered to lead to an exceedance;
 - CLminN — a measure of the ability of a system to "consume" deposited nitrogen (e.g. via immobilisation and uptake of the deposited nitrogen); and
 - CLmaxN — the maximum critical load of acidifying nitrogen, above which the deposition of nitrogen alone would be considered to lead to an exceedance.
- 5.5.27 The following observations can be made from the data presented in **Table 5.4**:
- Nitrogen deposition exceeds the lower critical load across all sites. This indicates a high risk of eutrophication and potential harm to the ecosystem. It is acknowledged that for the Mersey Estuary, a major contributor on nitrogen deposition is sewage discharges;
 - CL_e for NO_x and SO₂ is not exceeded across all sites but CL_e for NH₃ is exceeded at Mersey Estuary SSSI/SAC/Ramsar, River Dee SAC, Hoblane Ponds LWS, Shellway Road Pond South LWS and Gowy Meadows and Ditches LWS;
 - for the River Dee and Bala Lake SAC the maximum critical load of 10 kgN/ha/yr was used as 2 kgN/ha/yr is only applicable to alpine lakes; and
 - Background nitrogen (N) and sulphur (S) do not exceed CLmax N and CLmaxS respectively with the potential exception of Hoblane Ponds LWS.

Table 5.4 Mapped background concentrations and deposition over ecological sites

Ecological Site	NO _x (µg/m ³)	SO ₂ (µg/m ³)	NH ₃ (µg/m ³)	N-dep (kgN/ha/yr)	N-dep CL (kgN/ha/yr)	Acid dep (keq/ha/yr)	Acid dep CL (keq/ha/yr)
Mersey Estuary SPA/Ramsar	5.6	26.7	4.0	10-20	22.6	CL _{min} N: 0.856 CL _{max} N: 4.856 CL _{max} S: 4	1.9
Mersey Estuary FLL	2.1	3.9	2.4	10-20	22.6	CL _{min} N: 0.856 CL _{max} N: 4.856 CL _{max} S: 4	1.9
Mersey Estuary SSSI	7.8	26.7	3.1	10-20	21.5	Not sensitive	
River Dee and Bala Lake SAC	5.9	26.6	4.7	2-10	22.5	Not sensitive	
Gowy Meadows and Ditches LWS	5.9	26.6	4.1	10-20	21.9	CL _{min} N: 1.071 CL _{max} N: 5.071 CL _{max} S: 4	1.8
Hoblane Ponds LWS	5.2	26.7	3.6	10-15	38.5	CL _{min} N: 0.357 CL _{max} N: 1.723 CL _{max} S: 1.366	3.
River Gowy LWS	2.5	16.8	2.9	10-20	21.3	CL _{min} N: 1.071 CL _{max} N: 5.071 CL _{max} S: 4	1.7
Shellway Road Pond South LWS	5.9	26.6	3.8	10-20	21.9	CL _{min} N: 1.071 CL _{max} N: 5.071	1.8

Ecological Site	NO _x (µg/m ³)	SO ₂ (µg/m ³)	NH ₃ (µg/m ³)	N-dep (kgN/ha/yr)	N-dep CL (kgN/ha/yr)	Acid dep (keq/ha/yr)	Acid dep CL (keq/ha/yr)
						CL _{max} S: 4	
Station Road Railway Site LWS	2.7	17.3	2.5	10-20	20.6	CL _{min} N: 1.071 CL _{max} N: 5.071 CL _{max} S: 4	1.7
Wervin Meadows LWS	2.9	18.9	2.3	10-20	19.1	CL _{min} N: 0.999 CL _{max} N: 5.071 CL _{max} S: 4	1.6
Note: N-dep = Nitrogen deposition; Acid dep = Acid deposition.							

Future Baseline

- 5.5.28 At the national and regional level, a gradual reduction in atmospheric pollutant concentrations is anticipated due to measures like the Government's Clean Air Strategy (2019), improvements in real-world vehicle emissions, and stricter emission limits for industrial sources as environmental permits are updated to align with the Industrial Emissions Directive (2010).
- 5.5.29 However, the impacts of climate change may alter this trajectory by influencing pollutant formation, dispersion, and deposition patterns. For instance, increased temperatures can lead to higher ground-level ozone concentrations, while changes in precipitation patterns may affect pollutant removal rates. Furthermore, climate change may exacerbate existing air pollution issues in certain regions, particularly for vulnerable populations and sensitive ecosystems. There are uncertainties on the intensity and when these changes are likely to take effect; it is reasonable to assume that these are unlikely to occur during the expected duration of the Proposed Development.
- 5.5.30 At the local level, the future baseline against which the Proposed Development will be assessed, will take into account the future operation of the SMC, including Phase 1 of the CHP development and future availability of hydrogen as a fuel.

5.6 Description of Likely Significant Effects

- 5.6.1 The Proposed Development has the potential to impact air quality during both construction and operation. These potential impacts include:
- Dust and particulate matter emissions during construction from activities within the Site Boundary and along haul routes.
 - Changes in local air quality due to altered traffic patterns, speeds, and/or vehicle types on the surrounding road network during the construction of the Proposed Development.
 - Changes in local air quality once the development is operational will primarily result from emissions associated with the CHP facility. The CHP facility will involve emissions from hydrogen ready gas turbines and heat recovery steam generators, as detailed in **Chapter 2: The Proposed Development, Section 2.4.1**.

Construction Phase

Construction Dust Emissions

- 5.6.2 Dust generation is inevitable throughout the construction phase of the Proposed Development.
- 5.6.3 The IAQM Construction Dust (IAQM, 2024) Guidance outlines a methodology for assessing the risk of dust emissions from various construction activities, including demolition, earthworks, construction, and the tracking of dust onto public roads by vehicles.
- 5.6.4 An initial review of the Study Area identified possible sensitive locations (such as residential areas, commercial establishments, and parking lots) within 250m of the Site Boundary and 50m of potential transportation routes (extending up to 250m from the Site entrance). No ecological receptors were found within this 50m buffer zone around the Site or transport routes.

Construction Vehicle Emissions

- 5.6.5 Vehicle emissions from construction traffic travelling to and from the Site via designated routes could potentially impact local air quality.
- 5.6.6 This impact could be significant near sensitive areas, particularly residential properties located within 200m of potential construction haul routes and worker access routes. Once available, peak construction flows will be screened against the criteria for air quality assessment given in the EPUK and IAQM Land-Use Planning (EPUK and IAQM, 2017) guidance.

Operational Phase

Operational Plant Emissions

- 5.6.7 Combustion emissions from the existing CHP facility and the Proposed Development, such as NO_x, SO₂, PM₁₀ and CO, potentially affect both human health and sensitive ecological sites. Ammonia emissions can arise from the use of selective catalytic reduction (SCR) if installed on combustion plant and whilst unlikely to be a concern for human health, can potentially affect ecological sites. Furthermore, changes to nitrogen and acid deposition due to the Proposed Development may affect ecological receptors.
- 5.6.8 Therefore, the ES will include a detailed dispersion modelling study of routine emissions from the Proposed Development. This assessment will conservatively assume continuous discharge of these emissions at the maximum permissible concentration allowed by the regulator. It will consider the operation of the

Proposed Development alone and as an integral component of the SMC as a whole. The study will assess the changes to the emissions from the entire SMC resulting from the proposed Development and consider the various fuel compositions that may be utilised during the interim period before the existing CHP facility at the SMC is fully replaced by the Phase 1 CHP and the Proposed Development. The operation of the SMC with the Proposed Development will be assessed against the future baseline as described above.

- 5.6.9 An odour assessment is not proposed as the Proposed Development is not expected to introduce new odour sources.

Scope

- 5.6.10 A summary of the proposed scope for the air quality construction and operational phase assessments is presented in **Table 5.5**.

Table 5.5 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Fugitive dust emissions and increases in PM ₁₀ and PM _{2.5} on human and ecological receptors	Construction	✓		Sensitive human receptors within 250m, risk assessment required to define additional mitigation.
Non-Road Mobile Machinery (NRMM) emissions during construction of the Proposed Development on human and ecological receptors	Construction		✓	Construction activities may temporarily impact local air quality due to exhaust emissions from machinery used onsite, such as that used for piling, excavation and road construction. While specific details regarding the number and type of machinery are not currently available, all equipment will be required to comply with regulatory emission limits for NRMM. Given the temporary nature of these operations, the same scale of the Proposed Development, and the distance to sensitive receptors, significant impacts on local air quality are not anticipated. Therefore, assessment of

Element	Phase	Scoped In	Scoped Out	Justification
				emissions from NRMM is scoped out of the EIA.
Road vehicles emissions during construction of the Proposed Development on human and ecological receptors	Construction	✓		Potential to exceed IAQM criteria due to workforce numbers.
Road vehicles emissions during operation of the Proposed Development on human and ecological receptors	Operational		✓	During operation, the vehicle traffic will primarily consist of employee commutes, routine deliveries, and occasional maintenance visits. Given the anticipated small number of journeys and the resulting minimal increase in traffic compared to existing levels, the impact of operational transport on local air quality is not expected to be significant. Therefore, an assessment of operational phase transport emissions has been scoped out. It is unlikely that the IAQM criteria will be to exceed.
Combustion emissions and deposition during operation of the Proposed Development on human and ecological receptor	Operational	✓		Detailed modelling required to demonstrate no significant effects on nearby receptors for human health and ecological receptors.
Odour emissions during operation of the Proposed Development on human receptors	Operational		✓	There would be no sources of odour from the Proposed Development.

5.7 Mitigation Measures

- 5.7.1 The nature and type of mitigation measures required will be dependent on the findings of the assessment.
- 5.7.2 The Proposed Development will incorporate several design features to minimise potential environmental impacts. Key embedded primary mitigation measures will include:
- stack height optimisation to ensure adequate levels of dispersion; and combining the flues from multiple modules into combined stacks in order to increase the plume buoyancy and dispersion;
 - use of abatement technology such low NOx burners as Selective Catalytic Reduction (SCR) to ensure compliance with the most stringent Emission Limit Values for the proposed stack; and
 - ground protection: Implementing measures to minimise ground disturbance and protect soil and vegetation during construction.
- 5.7.3 To further reduce environmental impact, a series of additional mitigation measures will be implemented during construction. These measures will focus on minimising dust and particulate matter generation, release, and dispersal through industry best practices. All mitigation measures will be outlined in the ES and the Outline Code of Construction Practice (CoCP).
- 5.7.4 The Proposed Development must obtain an Environmental Permit to operate, which will mandate compliance with emission limits for stack emissions. These limits are established by regulations or specified by the regulator in the permit. In addition to adhering to these limits, the plant must also prove its utilisation of Best Available Technology (BAT) to control emissions, which includes implementing measures such as setting appropriate stack heights.

5.8 Assessment Methodology

- 5.8.1 **Chapter 3: Approach to EIA** outlines the general assessment methodology for the EIA. This section details how this methodology will be applied and modified to meet the specific requirements of the air quality assessment to be presented in the ES.

Construction Phase

Construction Dust Emissions

- 5.8.2 The qualitative assessment of the effects of the construction phase on local air quality in terms of dust/particulate matter generation will be based on the IAQM

Construction Dust (IAQM, 2024). Guidance for the control of dust and emissions during construction and demolition, and information available on this phase of the Proposed Development. The approach involves:

- The identification of emission sources and construction activities and the estimation of their potential dust emission magnitude.
- The identification of sensitive receptors for air quality impacts and the assessment of the sensitivity of the area to dust and particulate matter emissions.
- The estimation of the risk of impacts, considering the proximity of emission sources to the receptors and their magnitude.
- The definition of appropriate best practice mitigation measures where necessary, proportionate to the identified risk level. The guidance recommends that the assessment of significant effects is only made after application of embedded mitigation.

5.8.3 As per the IAQM Construction Dust (IAQM, 2024) Guidance, the relevant Study Area for assessing dust emissions encompasses a 250m radius from the construction source for human receptors and a 50m radius for ecological receptors. This also includes areas on either side of roads within 250m of the Site entrance for both types of receptors. Since only human receptors fall within the Study Area, ecological receptors will not be considered in the ES.

Construction Vehicle Emissions

5.8.4 The approach provided within the EPUK and IAQM Land-Use Planning (EPUK, IAQM, 2017) Guidance will be used to assess the air quality impacts from vehicle emissions during the construction phase on nearby receptors. Peak construction traffic flows, representative of a conservative scenario, will be screened against the criteria for air quality assessment given in the EPUK and IAQM Land-Use Planning (EPUK and IAQM, 2017) Guidance, which suggest a more detailed assessment is required where a development would:

- Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors (LDV = cars and small vans <3.5tonnes gross vehicle weight) with indicative criteria to proceed to an air quality assessment where there is:
 - A change of LDV follows of more than 100 Annual Average Daily Traffic flow (AADT) within or adjacent to an AQMA; and
 - More than 500 AADT elsewhere.

- Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors (HDV = goods vehicles + buses >3.5tonnes gross vehicle weight):
 - A change of HDV flows of more than 25 AADT within or adjacent to an AQMA; and
 - More than 100 AADT elsewhere.
- Realign roads, i.e. changing the proximity of receptors to traffic lanes; and
 - Where the change of 5m or more and the road is within an AQMA.
- Introduce a new junction or remove an existing junction near to relevant receptors.

- 5.8.5 Should any road links trigger the screening criteria, a detailed quantitative assessment of the effects of the vehicle exhaust emissions on local air quality will be undertaken using Atmospheric Dispersion Modelling System (ADMS)-Roads dispersion modelling software.
- 5.8.6 The assessment will involve examining the existing local air pollutant levels and identifying sensitive receptors (homes, schools, nursing homes, ecological sites) within 200m of potentially affected roads. An analysis of changes in traffic flow and speed resulting from construction traffic will be conducted, along with estimates of the resulting change in pollutant concentrations at receptor locations compared to AQS objectives.
- 5.8.7 Cumulative impacts will be considered inherently in the transport data which will reference future traffic flows, account for local growth projections and planned developments in the area.
- 5.8.8 The significance of the findings will be interpreted in line with EPUK and IAQM Land-Use Planning (EPUK and IAQM, 2017) Guidance, taking into account existing pollution levels, the magnitude and extent of any changes, and the duration of any modelled exceedances of air quality standards.

Operational Phase

Operational Plant Emissions

- 5.8.9 The Environment Agency and Defra (2016, updated 2024) Guidance provides on air quality assessments. This guidance outlines a screening process to identify and exclude pollutants that are unlikely to cause a significant impact on the environment.

- 5.8.10 According to the Environment Agency and Defra (2016, updated 2024) Guidance, a pollutant can be screened out if both of the following criteria are met:
- “the short term process contribution (PC) is less than 10% of the short term environmental standard; and*
- the long term PC is less than 1% of the long term AQS”.*
- 5.8.11 If the criteria are met, no further assessment of the pollutant is required.
- 5.8.12 However, if these criteria are not met, a second stage of screening is necessary to determine the potential impact of the Predicted Environmental Concentration (PEC). Detailed modelling may be required for any PECs not screened out as insignificant.
- 5.8.13 Given the potential for emissions associated with the Proposed Development to impact air quality, and the need to accurately assess their contribution to existing background concentrations, a detailed dispersion modelling study using the ADMS 6 model will be conducted. This approach allows for a comprehensive evaluation of the potential air quality impacts of the Proposed Development, ensuring that all relevant factors are considered and that any necessary additional mitigation measures can be identified and implemented.
- 5.8.14 This model will assess the main combustion products from the continuous CHP facility discharges under normal operating conditions throughout the year, considering both long and short term exposure. The main pollutants evaluated will include NO_x, SO₂ and PM₁₀. Additional pollutants may be assessed depending on the specific fuel composition and emissions abatement equipment used, particularly during the initial period of mixed fuel operation before transitioning to hydrogen-only.
- 5.8.15 The modelling will incorporate the influence of nearby buildings and terrain features.
- 5.8.16 Meteorological data from Liverpool airport, Speke will be used for the air quality assessment. This dataset will cover a minimum of five years to ensure a representative assessment of meteorological conditions and their influence on pollutant dispersion.
- 5.8.17 The modelling grid will be designed to adequately cover the maximum ground level concentrations and concentrations at sensitive receptors (including ecological sites and public rights of way) for both short and long term averaging periods.
- 5.8.18 Model results will be presented in tables and contour plots, and maximum concentrations at sensitive receptors will be evaluated against existing concentrations and emissions from the existing CHP facility, and relevant AQS

objectives. The significance of relevant pollutant concentrations on human health and ecological receptors will be determined by comparing them to relevant criteria.

- 5.8.19 Nitrogen and acid deposition rates will be calculated and compared to the critical loads for sensitive habitats identified within designated ecological sites.
- 5.8.20 Cumulative impacts will be considered, either explicitly within the dispersion modelling where appropriate, or qualitatively for both human and ecological receptors. In addition, for ecological sites subject to the Habitats Regulations, the assessment will consider the in-combination effects of the Proposed Development with other relevant plans and projects, including those that are proposed or committed but not yet operational. The specific developments to be included in this in-combination assessment will be determined in consultation with an ecologist and Natural England, ensuring a comprehensive evaluation of potential ecological impacts. Further details on this assessment will be provided in **Chapter 7: Biodiversity** and relevant methodologies are discussed in **Chapter 3: Approach to EIA**.

Significance Criteria

Construction Phase

Construction Dust Emissions

- 5.8.21 The IAQM Construction Dust (IAQM, 2024) Guidance “*recommends that significance is only assigned to the effect after considering the construction activity with mitigation*”. The purpose of the assessment is to determine the levels of risk posed in terms of loss of amenity due to dust soiling and to human health from particulate matter emissions so that an appropriate level of mitigation can be assigned. As the purpose of the mitigation is to prevent a significant effect, the normal finding is that the residual effect is ‘not significant’.

Construction Vehicle Emissions

- 5.8.22 The magnitude of change in the annual mean concentration of NO₂, PM₁₀, and PM_{2.5} due to the Proposed Development will be assessed using the criteria outlined in **Table 5.6** in accordance with EPUK and IAQM Land-Use Planning (EPUK and IAQM, 2017) Guidance. This assessment will be based on the percentage change in pollutant concentration at existing receptor locations relative to the Air Quality Assessment Level (AQAL), which is equivalent to the AQS objective. To describe the effect at a specific receptor, both the percentage change in concentration and the long term average concentration at that receptor in the assessment year will be considered, following the approach detailed in **Table 5.6**. Note that the terminology in **Table 5.6** follows that given in the EPUK

and IAQM guidance rather than the exact terminology set out within **Chapter 3: Approach to EIA** of this scoping report.

Table 5.6 Impact descriptors for individual receptors

Absolute concentration with Proposed Development, relative to assessment level	% Change in Concentration Relative to Assessment Level				
	0%	1%	2-5%	6-10%	>10%
75% or less	Negligible	Negligible	Negligible	Slight	Moderate
76–94%	Negligible	Negligible	Slight	Moderate	Moderate
95–102%	Negligible	Slight	Moderate	Moderate	Substantial
103–109%	Negligible	Moderate	Moderate	Substantial	Substantial
110% or more	Negligible	Moderate	Substantial	Substantial	Substantial

- 5.8.23 The approach to determining if the impacts from construction vehicle emissions will result in overall significant effects is predominantly based on professional judgement, considering such factors as the descriptors for impacts at receptors (as per **Table 5.6**), existing and future air quality without the development, the extent of current and future population exposure to the impact and the influence and validity of assumptions adopted when undertaking the prediction of impacts.

Operational Phase

Operational Plant Emissions

- 5.8.24 As noted above, operational impacts will consider operation of the whole SMC and consider various fuel availability options. The assessment of significance will be based on a reasonable worst case amongst these potential emission scenarios i.e. the scenario giving rise to maximum impacts, and also to impacts within the worst meteorological year out of 5 recent years and at the most affected receptor(s). This is a conservative approach.
- 5.8.25 Expert judgment is then used to determine if the impacts from operational CHP facility emissions will be significant overall. This judgment considers multiple factors including the sensitivity of the affected environment and the magnitude of the remaining impact, as defined by EPUK and IAQM Land-Use Planning (EPUK

and IAQM, 2017) Guidance for human receptors (detailed in **Table 5.6**) but also, as above for construction traffic, existing and future air quality without the development, the extent of current and future population exposure to the impact and the influence and validity of modelling assumptions.

- 5.8.26 While the Environment Agency and Defra (Environment Agency and Defra, 2016, updated 2025) Guidance is generally applicable, this assessment is specifically for planning purposes and will therefore prioritise EPUK and IAQM Land-Use Planning (EPUK and IAQM, 2017) Guidance. This approach ensures that the assessment aligns with best practices for air quality assessments in the planning context, while still considering relevant regulatory guidance.
- 5.8.27 However, the EPUK and IAQM Land-Use Planning (EPUK and IAQM, 2017) Impact Matrix is not suitable for assessing ecological sites. While IAQM (IAQM, 2019) Guidance on assessing air quality impacts on designated nature conservation sites suggests that a calculated PC increase of less than 1% of the critical level or load can generally be considered insignificant, exceeding this threshold does not automatically imply a significant or unacceptable impact. Rather, it indicates the need for a more thorough ecological assessment by a qualified ecologist. Ultimately, the significance of effects on ecological receptors will be set out within the Ecology Chapter of the Environmental Statement.

5.9 Assumptions and Limitations

- 5.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:
- Dust Risk Assessment: Professional judgement was used where information was unavailable.
 - Modelling Uncertainties: Both measured and predicted concentrations may have inherent uncertainties. The model (ADMS) relies on input data with uncertainties, and it simplifies complex physical systems into a range of algorithms. Local micro-climatic conditions might also affect pollutants concentrations beyond the model's capabilities. Any limitations to these data sources will be reported in the ES, along with any implications for the assessments.

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PUBLIC

EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 6: Noise and Vibration**

02-09-2026

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VOLUME 2 FIGURES

Figure 6.1	Baseline Noise Measurement Locations
Figure 6.2	Noise and Vibration Sensitive Receptors

VOLUME3 APPENDICES

No appendices

6. Noise and Vibration

6.1 Introduction

- 6.1.1 This chapter considers the potential impacts of the Proposed Development on noise and vibration sensitive receptors during the construction and operational phases. It sets out the proposed methodology for the noise and vibration assessment and identifies impacts that can be scoped out of the Environmental Impact assessment (EIA).
- 6.1.2 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.

6.2 Consultation and Engagement

- 6.2.1 There has been no specific consultation carried out in relation to the Proposed Development at the time of writing. The consultation undertaken on the Combined Heat and Power (CHP) Phase 1 TCPA is relevant to the scoping of the Proposed Development, as it has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the Proposed Development. An overview of the consultation undertaken for CHP Phase 1 is summarised in **Table 6.1**. Relevant feedback from the CHP Phase 1 TCPA will be used to inform the Environmental Statement (ES) for the Proposed Development.
- 6.2.2 Feedback in relation to this topic in the Phase 2 EIA Scoping Opinion will also inform the production of the ES.

Table 6.1 Consultation and engagement to date

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
Cheshire West and Chester Council (CWCC)	13 November 2024	Consultation note submitted by email containing: ■ presentation of the proposed assessment scope and approach to inform further discussions; and ■ presentation of proposed baseline noise survey approach.

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
		The consultation note was responded to as part of the CWCC Scoping Opinion (Ref. 24/03305/SCO). All responses will be factored into the production of the ES.

6.3 Guidance

6.3.1 This chapter has, and when undertaking the assessment for the ES, will give consideration to the following guidance:

- British Standard BS5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Noise (BS 5228-1) (British Standards Institution (BSI), 2014);
- British Standard BS5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Vibration (BS 5228-2) (BSI, 2014);
- British Standard 7445: 2003 Description and Measurement of Environmental Noise (BS7445: 2003) (BSI, 2003);
- ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: Engineering method for the prediction of sound pressure levels outdoors (ISO 9613) (ISO, 2024);
- BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS4142:2014+A1:2019) (BSI, 2019);
- Design Manual for Roads and Bridges (DMRB) Sustainability & Environment Appraisal LA 111 Noise and Vibration (Highways England, 2020); and
- Calculation of Road Traffic Noise. Department of Transport and Welsh Office, 1988.

6.4 Study Area

Construction Phase

Construction Noise

6.4.1 The construction noise Study Area will encompass the Site and sensitive receptors in proximity to identified noisy operations, to a distance of 300 metres (m) from the Site Boundary. This is in line with guidance set out in DMRB LA 111 (Highways

England, 2020). Some level of flexibility in the Study Area boundary can however be applied based on assessment outcome.

Construction Vibration

- 6.4.2 The construction vibration Study Area will encompass the Site Boundary and sensitive receptors in proximity to identified vibration generative activities and will generally be limited to an area no greater than 100m from the closest construction activity. This is in line with guidance set out in LA 111 (Highways England, 2020). Some level of flexibility in the Study Area boundary can however be applied based on assessment outcome.

Operational Phase

Noise from Operational Plant

- 6.4.3 The Study Area for the assessment of noise from the Proposed Development when operational will be defined by the Site Boundary and sensitive receptors closest to the Site. It is anticipated that a Study Area no greater than 1 kilometre (km) radius from the Site Boundary will be sufficient. This is based on professional judgement; however, this will be reviewed as part of the assessment.

6.5 Baseline Conditions

- 6.5.1 Information on baseline conditions has been obtained based on noise survey data collected for the Proposed Development as well as that previously collected as part of other recent projects in proximity to the Proposed Development. Relevant baseline information is presented in chronological order in the following sections.

Existing Baseline

Previously Collected Data

- 6.5.2 Baseline information, including noise measurement data gathered as part of the SMC Hydrogen Production Plant (HPP) planning application (Ref. 21/04091/FUL) (as set out in **Section 2.3 of Chapter 2: The Proposed Development**) has been reviewed to inform this chapter. Given that the location of the HPP is in proximity to the Proposed Development, the information contained in this application is of relevance to the Proposed Development. Specifically, the baseline conditions presented in the HPP ES (Document Ref 5194812-000-4PER-4-003) and Environmental Permit Assessment (Document Ref. 52100845/EA/Noise) have been considered.

6.5.3 Previously collected baseline noise information corresponds to noise monitoring undertaken in 2016, 2021 and 2022. Measurements were undertaken at locations representative of noise sensitive receptors (NSRs) applicable to the HPP planning application and the SMC as a whole. **Table 6.2** presents a summary of measured sound levels at key locations as shown in **Volume 2, Figure 6.1: Baseline Noise Measurement Locations**. Details of these surveys, including survey dates, periods, and equipment used can be found within the noise assessment report accompanying the HPP planning application (Ref. 21/04091/FUL) (Document Ref 5194812-000-4PER-4-003, Appendix 14.2).

Table 6.2 Previously collected baseline noise data

Ref	Location Name	Description	Survey year	Period	L _{Aeq,T} , decibels (dB)	Typical L _{A90,T} , dB	Typical L _A F _{max,15m in} , dB
P1	Parkland Drive, Elton	Representative of NSR in Elton to east of the Site	2016 ²	Day	55	46	72
				Night	52	51	57
			2021 ¹	Day	53	47	74
				Night	48	46	57
			2022 ²	Day	56	54	69
				Night	50	48	57
P2	The Square, Ince	Representative on NSR in Ince to north east of Site	2016 ²	Day	59	44	70
				Night	49	47	64
			2021 ²	Day	58	48	73
P3	Pool Lane, Thornton-le Moors	Representative of NSR in Thornton-le-Moors to south of Site	2016 ²	Day	55	52	68
				Night	50	47	60
			2021 ²	Day	53	51	62

Notes:

1 Long term unattended measurements.

2 Short term measurement representing 15 minute durations.

Note: It was deemed that background (LA90) sound levels are broadly comparable at all locations. The modal background sound level obtained for the long-duration survey at P1 of 46 dB LA_{eq,15min} was therefore used in the HPP assessment of operational noise at all noise sensitive receptors.

CHP Phase 1 TCPA 2024 Noise Survey Data

- 6.5.4 Additional noise measurement data have been collected at Locations P1, P2 and P3 in 2024. Measurements were short term and attended.
- 6.5.5 At location P1, night-time measurements were taken during the period 23:34 on 13 November 2024 to 02:02 on 14 November 2024. Daytime measurements were undertaken between 14:50 and 16:20 on 08 November 2024 and between 12:50 and 13:50 on 04 December 2024.
- 6.5.6 At locations P2 and P3, night-time measurements were undertaken between the period 23:00 on 11 June and 03:42 on 12 June 2024. Daytime measurements at P2 and P3 were undertaken during the period 10:55 and 14:34 on 18 June 2024.
- 6.5.7 Weather conditions during survey periods were dry and calm. The local noise environment in proximity to locations P1, P2 and P3 was noted to predominantly consist of local and distant road traffic noise as well as noise from the SMC.
- 6.5.8 Longer term unattended measurements were undertaken at a location (LT3) to the east of Thornton-le-Moors within Wildlife Trust Holly Bank House land between 12:15 on 08 November 2024 and 08:45 on 10 November 2024. This location was adopted as being representative of dwellings in Thornton-le-Moors and travellers' sites to the south of the A5117 Hill View Way. The local noise environment at this location consisted of distant road traffic predominantly from the A5117, noise from SMC, as well as natural noise sources such as birds and rustling leaves. Weather conditions during the survey period were dry and calm. A summary of the collected noise measurement data is presented in **Table 6.3**.

Table 6.3 2024 noise measurement data

Location	Date	Period	L _{Aeq,T} ,dB	Typical L _{A90} ,dB	L _{AFmax} Range, dB
P1	08-11-2024	14:50 – 16:20	61	53 ²	N/A
	13-11-2024	23:24 – 23:44	54	46 ³	79 ¹
	14-11-2024	00:36 – 00:56	47	45 ³	64 ¹
	14-11-2024	01:42 – 02:02	50	45 ³	76 ¹
	04-12-2024	12:50 – 13:50	62	58 ²	N/A
P2	11-06-2024	23:00 – 23:20	50	45 ⁴	50-71
	12-06-2023	00:55 – 01:15	51		52-72
	12-06-2023	02:33 – 02:48	51		56-58

Location	Date	Period	L _{Aeq,T} ,dB	Typical L _{A90} ,dB	L _{AFmax} Range, dB
	18-06-2024	10:55 – 11:55	59	47 ⁵	N/A
P3	11-06-2024	23:35 – 23:55	51	50 ⁴	52-54
	12-06-2024	01:30 – 01:50	52		53-66
	12-06-2024	03:02 – 03:17	52		54-55
	18-06-2024	12:13 – 13:13	54	52 ⁵	N/A
LT3	Day ⁶	07:00 – 23:00	57	53 ²	N/A
	Night ⁷	23:00 – 07:00	50	45 ²	57-71 ⁸

Notes:

¹ Highest L_{AFmax} in measurement period

² Typical L_{A90} based on analysis of 15 minute periods

³ Typical L_{A90} based on average of measurement period

⁴ Typical L_{A90} based on average of measurement periods

⁵ Average of measurement period.

⁶ Average of total daytime periods

⁷ Average of total night-time periods

⁸ Range applicable to 15-minute measurement periods

- 6.5.9 Typical background sound levels have been obtained from studying both the daytime and night-time periods across the data presented in **Table 6.2** and **Table 6.3**. These previously collected background sound levels will be used to inform the operational phase Environmental Statement noise assessment for the Proposed Development.
- 6.5.10 The noise survey data collected in 2024 is comparable to the data collected for the HPP ES presented in **Table 6.2**.
- 6.5.11 In addition to the noise surveys undertaken at P1, P2, P3 and LT3, a site visit to the operational SMC was undertaken on 24 April 2024 during the period 09:45 to 12:30. A number of onsite spot noise measurements and observations were undertaken at the boundary of the HPP site and in proximity to the Proposed Development during this visit. It was noted that onsite noise was generally consistent but was observed to include intermittent variance and characteristics such as noise from valve releases. Measured onsite noise levels typically ranged between 63 and 70dB L_{Aeq,T}.

Sensitive Receptors

Human Receptors

- 6.5.12 Sensitive receptors are those that are of greatest sensitivity to noise and vibration impacts. These include dwellings, education facilities, healthcare facilities and places of worship.
- 6.5.13 From both a desk-based and site-based review of the Site and surrounding area, it has been identified that there are a number of noise and vibration sensitive receptors in proximity to the Site. The closest and most sensitive receptors / areas identified include the following as shown within **Volume 2, Figure 6.2: Noise and Vibration Sensitive Receptors**:
- Little Meadow Park (receptor location R1) and The Stables (receptor location R2) travellers' sites to the south of the Site at distances of approximately 70m and 130m respectively from the Red Line Boundary at its closest point;
 - properties in Thornton-le-Moors (receptor location R3) to the south of the Site at a distance of approximately 60m from the Red Line Boundary at its closest point;
 - properties in Elton (receptor location R4), also including Elton Primary School, to the east of the Site at distances of approximately 140m to the closest dwellings and 400m to the school from the Red Line Boundary at its closest point; and
 - properties in Ince (receptor location R5) to the northeast of the Site at a distance of approximately 200m from the Red Line Boundary at its closest point.
- 6.5.14 The listed sensitive receptors are also representative of neighbouring properties in their vicinity.

Noise Important Areas

- 6.5.15 The presence of Noise Important Areas (NIAs) is also relevant to the Proposed Development. The NIAs have been identified by Department for Environment, Food and Rural Affairs (Defra) in accordance with the European Commission 2002/49/EC Directive of the European Parliament and the Council of 25 June 2002 (Environmental Noise Directive) and associated Environmental Noise (England) Regulations 2006. Based on a nationwide strategic noise mapping exercise, the NIAs are defined as the locations where 1% of the population are affected by the highest noise levels from major roads. The closest is NIA 8192 which is at a distance of greater than 1km from the Site. On this basis, there are no NIAs which fall within the Construction or Operational phase Study Areas.

Ecological Receptors

- 6.5.16 There are a number of ecological receptors that have designating features with the potential to be affected by noise and vibration e.g. birds and fish. The Mersey Estuary Special Protection Area (SPA), Ramsar and Site of Special Scientific Interest (SSSI) are located approximately 0.7km north of the Red Line Boundary at its closest point. Seven non-statutory county designated Local Wildlife Sites (LWS) have also been identified within a 2km radius of the Site, some of which have designating features that could be affected by noise. Further details of ecological receptors are presented in **Chapter 7: Biodiversity**. Assessment of impacts at ecological receptors will be presented in **Chapter 7: Biodiversity**, of the ES.

Future Baseline

- 6.5.17 The existing land surrounding the Site is of a mixed industrial, urban and rural / agricultural nature. There is therefore potential for new development to influence future noise levels. Given the relative dominance of road traffic noise and noise from the SMC, it is not anticipated that such changes would change the character of the existing noise environment in proximity to the Site.
- 6.5.18 Similarly, future baseline vibration levels are not anticipated to change because of future development.
- 6.5.19 There are a number of changes that are proposed for the SMC itself, such as the proposed HPP, CHP Phase 1, and other facilities in the local area such as the HyNet project. These developments have the potential to influence future baseline noise levels both as a result of their construction and operational phases.
- 6.5.20 The ES for the consented HPP (Document Ref 5194812-000-4PER-4-003) concluded that there would be no significant noise effects at the nearest receptors from the operation of the proposed plant. The worst-case operational impact of the HPP was predicted to be +2dB above the background sound level at The Stables travellers' site and was assessed as being of a low magnitude of impact. Furthermore, the planning consent applicable to HPP Phase 1, within Condition 19 requires that the *"rating level emitted from any plant/ machinery associated with the proposed development shall be 5dB(A) below the background noise level (measured as an L₉₀)"*.
- 6.5.21 The ES for the CHP Phase 1 planning application (yet to be determined) concluded that there would be operational phase effects of Negligible to Minor adverse significance (Not Significant) at the worst-case receptors closest to the Site. The worst-case operational impact of CHP Phase 1 was predicted to be +3dB above the background sound level at residential properties in Thornton-le-Moors during the night, and was assessed as being a Minor magnitude of impact. As part of additional mitigation and monitoring, amongst other measures, the ES states

that an Operational Noise Mitigation Plan will be prepared as part of the Operational Management Plan and will detail the final noise mitigation measures necessary to secure that only Negligible to Minor effects would arise.

- 6.5.22 The influence of climate change on the future baseline noise environment experienced at sensitive receptors is difficult to predict. Future changes in average temperatures have the potential to affect the operation of the SMC in terms of cooling requirements with associated influence on noise emissions. These changes however cannot be readily quantified.

6.6 Description of Likely Significant Effects

Construction Phase

- 6.6.1 The potential effects associated with the construction phase may include:
- onsite construction noise has the potential to result in significant adverse effects at local sensitive receptors due to the nature of construction activities to be undertaken and proximity of the Site to such sensitive receptors; and
 - onsite construction vibration has the potential to result in significant adverse effects at local sensitive receptors due to the nature of construction activities to be undertaken and proximity of the Site to such sensitive receptors.
- 6.6.2 Potential noise and vibration effects arising from the construction phase of the Proposed Development will be temporary in nature, for the duration of the construction phase only.

Operational Phase

- 6.6.3 The potential effects associated with the operational phase may include:
- Noise from the operation of the Proposed Development, including but not limited to the gas turbines, Heat Recovery Steam Generators, pumps, compressors, exhaust systems and auxiliary equipment.
- 6.6.4 Any potential noise effects arising from the operational phase of the Proposed Development will be long term and permanent until decommissioning but will be generally localised.

Scope

- 6.6.5 A summary of the proposed scope for the noise and vibration construction and operational phase assessments is presented in **Table 6.4**.

Table 6.4 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Construction noise on sensitive receptors in proximity to construction works.	Construction	✓		Potential for direct impacts due to proximity of proposed construction works to sensitive receptors.
Construction vibration on sensitive receptors in proximity to construction works.	Construction	✓		Potential for direct impacts due to proximity of proposed construction works to sensitive receptors.
Construction traffic noise on sensitive receptors adjacent to construction traffic routes.	Construction		✓	Given that traffic routes local to the Site currently experience substantial traffic flows, it is anticipated that construction traffic will be diluted in existing flows such that significant noise level changes will not occur. This is supported by Chapter 17: Transport and Movement where it is not anticipated that the development will result in a significant increase in traffic on the local highway.
Noise from the operation of the Proposed Development on sensitive receptors in proximity to the Proposed Development.	Operational	✓		Potential for direct impacts due to the nature and proximity of the Proposed Development to sensitive receptors.
Operational traffic noise on sensitive receptors adjacent to the local road network.	Operational		✓	Road traffic movements associated with the operation of the Proposed Development are anticipated to be minimal such that significant effects are not expected to occur.
Operational vibration on sensitive receptors in proximity to the Site.	Operational		✓	Given the nature of the Proposed Development sources of significant operational vibration are not anticipated.

6.7 Mitigation Measures

Embedded Mitigation

- 6.7.1 In line with the aim of government noise policy set out within the Noise Policy Statement for England 2010 to minimise adverse impacts on health and quality of life as far as is sustainable, the magnitude of impact and the number of people adversely affected by them will be minimised by noise and vibration mitigation integrated into the Proposed Development.
- 6.7.2 Mitigation measures will be incorporated into the Proposed Development design or will be recorded in the Outline Code of Construction Practice (Outline CoCP), incorporating general good practice and specific mitigation measures.
- 6.7.3 Potential construction phase noise and vibration mitigation measures for a development of this nature could include, but are not limited to:
- prior consent for any works outside core hours, where there is potential for significant adverse effects;
 - selection of quiet and low noise equipment and working methodologies;
 - optimal location of acoustic screening to minimise noise adverse effects where necessary;
 - optimal location of equipment onsite to minimise noise disturbance;
 - the provision of acoustic enclosures around static plant, where necessary;
 - use of less intrusive alarms, such as broadband vehicle reversing warnings; and
 - adoption of a clear and structured communication and engagement plan, providing contact details for nominated site contact and regular engagements with local residents.
- 6.7.4 Embedded mitigation measures applicable to the operational phase, where appropriate, will be considered as part of the operational phase assessment based on available design information. Consideration will be given to appropriate noise level criteria to be derived for the operational development, and appropriate measures that are necessary to achieve these.

Additional Mitigation

- 6.7.5 The requirement for mitigation associated with the construction and operation of the Proposed Development will be determined as part of the respective assessments. Where identified as being required, additional mitigation opportunities may include, but not be limited to the following:

Construction phase

- Commitment to undertake noise and / or vibration monitoring and necessary and appropriate corrective action to minimise the potential for significant adverse effects to occur. Any such monitoring protocols would be incorporated in construction method statements prepared by the Principal Contractor and secured through the CoCP.

Operational phase

- preparation of an Operational Noise Management Plan as part of the Operational Environmental Management Plan detailing the noise mitigation measures required to minimise potential adverse noise effects;
- consideration of plant noise emissions during plant selection to ensure that quietest practicable options are selected;
- appropriate siting of plant where possible to maximise distance to sensitive receptors and achieve acoustic screening from intervening structures;
- placing of plant items within buildings wherever possible, for plant and equipment which does not involve flammable or hazardous materials;
- selection and implementation of acoustic enclosures or 'jackets' with appropriate insertion loss values to appropriately reduced noise emission levels where required;
- selection and implementation of acoustic attenuators with appropriate insertion loss values where required;
- acoustic shielding of safety vents, pumps, fans, and compressors; and
- orientation of directional noise sources such that noise is directed away from sensitive receptors.

6.8 Assessment Methodology

- 6.8.1 Previously collected baseline noise measurement data (see **Table 6.2** and **Table 6.3**) will be applied for the purpose of both the construction and operational phase assessments.
- 6.8.2 Drawing upon the baseline noise survey results, the following assessments will be undertaken to determine the impact of noise and vibration during the construction and operational phases. The significance of effect will be determined by accounting for the predicted magnitude of impact and the sensitivity of receptors, whilst also considering relevant contextual factors.

Construction Phase

Construction Noise

- 6.8.3 Construction phase noise effects generated by onsite construction activities, including any activities which may be undertaken outside of normal working hours (It is anticipated that core working hours will be Monday to Friday 08:00 to 18:00. On Saturdays, standard working hours will be 08:00 to 13:00), will be assessed in general accordance with the guidance presented within BS 5228-1. The assessment will be quantitative based on construction noise calculations adopting information and assumptions applicable to anticipated construction activities and the plant items to be used during key stages of the construction phase.
- 6.8.4 BS 5228-1 (BSI, 2014) Section E.3.2 and Table E.1 will be adopted to assist with the determination of likely significance, with consideration also given to other contextual factors such as the duration of noise generating activities.
- 6.8.5 Appropriate mitigation measures will be considered with the aim of minimising potential adverse effects where reasonable and practicable. The focus will be on mitigation measures to be secured through the Outline CoCP, which will be included in the ES as embedded mitigation.

Construction Vibration

- 6.8.6 Potential construction vibration effects will be assessed at a sample of the closest sensitive receptors to the Site drawing upon information available on activities to be undertaken during the construction phase.
- 6.8.7 Construction vibration effects will be assessed in general accordance with the guidance presented within BS 5228-2 (BSI, 2009) and the documents referenced therein. The significance of effects will be determined by drawing upon the guidance contained in BS 5228-2 (BSI, 2009).
- 6.8.8 Where necessary, appropriate mitigation measures will be identified with the aim of minimising potential adverse effects where reasonable and practicable. The focus will be on mitigation measures to be secured through the Outline CoCP, which will be included in the ES as embedded mitigation. It is possible that receptors will fall outside of the construction vibration Study Area and may therefore be unlikely to result in significant adverse effects. This will be confirmed as part of the assessment following review of available construction information.

Operational Phase

- 6.8.9 A 3D computer noise model will be prepared using the DataKustik CadnaA® PC based noise modelling software, to predict noise levels and associated impacts

likely to arise from the operation of the Proposed Development. The model will incorporate information from the design process for key noise generative plant items including relevant geometry and sound power levels. The noise model will be used to calculate noise propagation in line with Part 2 of ISO 9613 (2024).

- 6.8.10 Calculated noise levels will be assessed at local sensitive receptors (i.e. closest dwellings) adopting the guidance set out in BS4142:2014+A1:2019. The assessment approach will also consider the outcome of consultation with Cheshire West and Chester Council as well as the approach adopted for recent applications involving noise generative development within the SMC.
- 6.8.11 Noise modelling outputs will be provided for ecological receptors. Assessment of impacts upon these receptors will be presented in **Chapter 7: Biodiversity**.
- 6.8.12 Where identified as being necessary, the assessment will outline noise mitigation measures, and where appropriate, the noise model will be used to quantify the acoustic benefit of those measures.

Significance Criteria

Construction Noise

- 6.8.13 For construction noise, the impact magnitude and effect level criteria will be determined based on the margin by which predicted construction noise levels are expected to comply with construction noise assessment criteria derived following the assessment method detailed within BS5228-1(BSI, 2014) Section E.3.2 and Table E.1 (the ABC method).
- 6.8.14 For the purpose of the assessment, on a worst case basis, all identified sensitive receptors will be considered as high sensitivity. **Table 6.5** details the proposed impact magnitude criteria.

Table 6.5 Construction noise impact magnitude

Construction Noise Level (x)	Impact Magnitude
$x < \text{Existing } L_{Aeq,T} \text{ noise level}$	Negligible
$\text{Existing } L_{Aeq,T} \text{ noise level} \leq x < \text{Receptor ABC criterion}$	Minor
$\text{Receptor ABC criterion} \leq x < \text{Receptor ABC criterion} + 5\text{dB}$	Moderate
$x \geq \text{receptor ABC criterion} + 5\text{dB}$	Major

- 6.8.15 The thresholds presented in **Table 6.5** can be applied to show where there could be a significant adverse effect as a result of the level of construction noise.

However, the context and duration of the impact also needs to be considered when determining the final significance of effect.

- 6.8.16 Within Section E4 of BS 5228-1 (BSI, 2014), example thresholds to determine eligibility for noise insulation are given and a duration for exceedance of threshold levels is stated as follows:

“...for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months.”

- 6.8.17 A significant effect will therefore be defined where a sensitive receptor exceeds a moderate impact magnitude for longer than a period of 10 or more days of working in any 15 consecutive days, or for a total number of days exceeding 40 in any six consecutive months.

Construction Traffic Noise

- 6.8.18 For construction generated road traffic noise, the impact magnitude criteria have been determined based on the classification scales presented within DMRB LA111. The resulting impact magnitude criteria are detailed within **Table 6.6**. For receptors of high sensitivity, such as dwellings, impacts of moderate and major magnitude are significant.

Table 6.6 Construction traffic noise impact magnitude

Short-term BNL change, dB	Impact Magnitude
0.0 – 0.9	Negligible
1.0 – 2.9	Minor
3.0 – 4.9	Moderate
5+	Major

Construction Vibration

- 6.8.19 For construction vibration, the impact magnitude criteria will be determined based on the guidance contained within BS5228-2 (BSI, 2014), for human perception.
- 6.8.20 **Table 6.7** details the proposed impact magnitude criteria. For receptors of high sensitivity, such as dwellings in proximity to the Site, depending on a number of contextual factors, impacts of moderate and major magnitude will be deemed to be significant.

Table 6.7 Construction vibration impact magnitude

Construction Vibration Noise level (x), PPV mm/s	Impact Magnitude
$X < 0.3$	Negligible
$0.3 \leq x < 1.0$	Minor
$1.0 \leq x < 10$	Moderate
$x \geq 10$	Major

- 6.8.21 The thresholds presented in **Table 6.7** indicate associated impact magnitude. However, the context and duration of the impact also needs to be considered when determining the final significance of effect.
- 6.8.22 A significant effect will therefore be defined where a sensitive receptor is expected to exceed the moderate impact magnitude for longer than a period of 10 or more days of working in any 15 consecutive days, or for a total number of days exceeding 40 in any six consecutive months.

Operational Phase

- 6.8.23 For noise from the operation of the Proposed Development, the magnitude of impact will be determined based on guidance contained within BS4142:2014+A1:2019. The method set out in BS4142:2014+A1:2019 compares the rating level of the sound source with the background sound level. The standard refers to the rating level, which describes the specific source level corrected for acoustic features, where appropriate. Certain acoustic features can increase the significance of the impact over that expected from a direct comparison between the specific sound level of the source and the background sound level. Acoustic features of the source include characteristics that may attract attention such as tonality, impulsivity and intermittency. Acoustic features added to the specific sound level form the rating noise level.
- 6.8.24 The difference in background and rating level is taken as an initial estimate of the magnitude of impact. The following is stated within BS4142:2014+A1:2019:
- *“Typically, the greater this difference, the greater the magnitude of the impact.*
 - *A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
 - *A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.*
 - *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact*

or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.”

6.8.25 **Table 6.8** details the proposed impact magnitude for operational noise based on the initial estimate of the impact of the rating level by subtracting the measured background sound level.

Table 6.8 Operational noise magnitude of impact

BS4142 Descriptor	Excess of Rating Level over Background Sound Level	Impact Magnitude
Indication of a low impact, depending on context	≤0dB	Negligible
Not defined in BS4142	Between 0 and +5dB	Minor
Indication of an adverse impact, depending on the context	Around +5dB	Moderate
Indication of a significant adverse impact, depending on context	+10dB or greater	Major

6.8.26 Significance is dependent on both the margin by which the rating level of the specific sound source exceeds the background sound level but also the context in which the sound occurs. Factors taken into consideration for the context may include:

- the absolute sound level at the individual receptor;
- the character and level of the residual sound compared to the character and level of the specific sound; and
- the sensitivity of the receptor and whether dwellings already incorporate noise mitigation measures.

6.8.27 The above factors will be accounted for when determining whether the resulting effect is significant or not.

6.8.28 It is also acknowledged that, for the CHP Phase 1 TCPA, Cheshire West and Chester Council has stated preference for the plant noise Rating Level to be 5dB below the background sound level at sensitive receptors. Consideration will be given to this as part of the operational noise assessment, plant design and mitigation with the aim of minimising potential for background noise level increase and to control the potential for cumulative impacts (those associated with other developments in the locality) to arise.

6.9 Assumptions and Limitations

6.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The noise assessments, associated modelling and predictions will incorporate many different data sources. The outcome of the modelling is therefore reliant on the quality of these data sources. Any limitations to these data sources will be reported in the ES, along with any implications for the assessments.

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PUBLIC

EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 7: Biodiversity**

02-09-2026

Document ref: 2026UK550445-ENV-001



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VOLUME 2 FIGURES

Figure 7.1 Designated Site Plan- Statutory

Figure 7.2 Designated Site Plan- Non-statutory

Figure 7.3 UK Habitat Plan

VOLUME 3 APPENDICES

Appendix 7.1 Preliminary Ecological Appraisal

7. Biodiversity

7.1 Introduction

- 7.1.1 This chapter considers the potential impacts of the Proposed Development on biodiversity during the construction and operational phases. It sets out the proposed methodology for the biodiversity assessment and identifies impacts that can be scoped out of the EIA. The 'Site' as it is hereafter defined as includes all land encompassed by the redline boundary.
- 7.1.2 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.

7.2 Consultation and Engagement

- 7.2.1 There has been no specific consultation or engagement carried out in relation to Biodiversity for the Proposed Development at the time of writing.
- 7.2.2 Engagement undertaken for Phase 1 of the Combined Heat and Power (CHP) development, which is a precursor to Phase 2, is summarised in **Table 7.1**. Phase 1 comprises a Town and Country Planning Act (TCPA) regime application for the CHP, with determination anticipated later in 2026.
- 7.2.3 The engagement undertaken on Phase 1 to date is relevant to the Scoping of Phase 2 as it has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the subsequent phase of the project.
- 7.2.4 An EIA Scoping Opinion (24/03305/SCO) in relation to Phase 1 was received by the Applicant from Cheshire West and Chester Council (CWCC) on 24 January 2025. The responses were received from CWCC, the Environment Agency (EA) and Natural England (NE) in relation to Biodiversity.
- 7.2.5 Feedback in relation to this topic and the scope of works will be gained as part of the Proposed Development Scoping Opinion, and this will inform the production of the Environmental Statement (ES).

Table 7.1 Consultation and engagement to date

Body/ Organisation	Date of Engagement	Key Outcomes of Discussions
EA	March 2025 EA Ref: SO/2024/124554/01- L01	The EA was consulted as part of the Phase 1 EIA Scoping Opinion (24/03305/SCO). The responses to this are detailed within the Scoping Opinion response (24/03305/SCO). <u>Summary of Comments:</u> <i>‘Overall, we accept the principles highlighted within the ‘Biodiversity’ topic of the EIA Scoping Opinion report, however, we note with regards to ‘Protected and Notable Species’ under Table 7-6 it has been identified that the Gale Brook is ‘of limited suitability to support freshwater fish’. This conclusion does not appear to consider the possible presence of European Eel (Anguilla anguilla), nor the role the brook may be playing in connecting the upstream migration of elver from the Mersey Estuary to aquatic habitat upstream of Stanlow. Eel are an endangered species, protected by the Eel Regulations (2009) and may enter the brook via connections to the Mersey Estuary.’</i> The EA advised that the latest Ecological Impact Assessment guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM, 2024) should be followed. Comments on Biodiversity Net Gain (BNG) were provided, which were outlined within Appendix 7-3: Biodiversity Net Gain Statement (Volume 3) of the Phase 1 Biodiversity Chapter.
NE	November 2024 NE Ref: 493121	<u>Summary of Comments:</u> <i>‘A robust assessment of environmental impacts and opportunities based on relevant and up to date environmental information should be undertaken prior to a decision on whether to grant planning permission. Annex A to this letter provides Natural England’s advice on the scope of the Environmental Impact Assessment (EIA) for the proposed development. Annex A – Natural England Advice on</i>

Body/ Organisation	Date of Engagement	Key Outcomes of Discussions
		<i>EIA Scoping provided guidance on matters relating to Biodiversity including:</i> <i>General Principles</i> <i>Cumulative and In-combination Effects</i> <i>Environmental Data</i> <i>Designated Sites</i> <i>Habitats Regulation Assessment</i> <i>Noise Impacts;</i> <i>Priority Habitats</i> <i>Protected Species including District level Licensing for great crested newts; and</i> <i>Biodiversity Net Gain'</i>
NE	February 2026 NE Ref: 537982	Following the submission of the Phase 1 Habitats Regulations Assessment (HRA) report a follow-up response was received from NE in February 2026. <u>Summary of Comments:</u> Natural England requires further information in order to determine the significance of these impacts and the scope for mitigation. The following information is required: A revised HRA that has further consideration of air quality impacts of the proposal on Designated Sites, including progressing process contribution emissions in excess of 1% to appropriate assessment. A clear and robust set of bird survey data to determine if further assessment of impacts of the proposal on Gowy Meadows is required.
CWCC Natural Environment Officer	February 2025 CWCC Reference: 24/03305/SCO	<u>Summary of Comments:</u> CWCC provided a number of comments on the Phase 1 scoping report and associated ecological documents as follows: <i>'Preliminary Ecological Appraisal and UK Habitat Plan:</i>

Body/ Organisation	Date of Engagement	Key Outcomes of Discussions
		<i>Inclusion of linear watercourse features to be reviewed.</i> <i>Requirement to include consideration of effects upon Habitats of Principal Importance (HPI) such as Open Mosaic Habitat</i> <i>Badger: Consideration of potential effects upon badger setts located in proximity to the Site</i> <i>Great crested newts: Justification for scoping out this species from EclA requested.</i> <i>Birds: Consideration of ground nesting birds to in EclA requested;</i> <i>Freshwater Fish: Reference to EA response and consideration of fish within this EclA</i> <i>Habitats Regulations Assessment:</i> <i>Concur that the relevant designated sites included in the HRA Screening report align to those listed in the NE response. Request to consider groundwater effects within HRA.'</i>

7.3 Guidance

7.3.1 This chapter has, and when undertaking the assessment for the ES, will give consideration to the following guidance:

- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2024);
- Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017);
- Biodiversity: Code of practice for planning and development (2013): BS 42020:2013 (BSI, 2013);
- The Statutory Biodiversity Metric User Guide (Defra, 2026); and
- Biodiversity Gain Statement for Energy (Defra, 2026).

7.3.2 Technical guidance that will be applied during ecological surveys (where relevant) includes (but not limited to):

- UK Habitat (UKHab) Classification (Version 2.01 2023) (UK Habitat Classification, 2023);
- Great Crested Newt Mitigation Guidelines (English Nature, 2001);
- Great Crested Newt Conservation Handbook (Langton, Beckett and Foster, 2001) and for Habitat Suitability Index (HSI) Surveys (Oldham *et al.*, 2000);

- Badger survey guidance including (Roper, 2010) and Guidance on 'Current Use' in the definition of a Badger Sett (Andrews, 2013 and Harris *et al.*, 1989);
- Water Vole Mitigation Handbook. (Dean *et al.*, 2016);
- Water Vole Conservation Handbook (3rd edition) (Strachan *et al.*, 2011);
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition 2023) (Collins, 2023); and
- Otter *Lutra lutra* survey guidance (Chanin, 2000).

7.4 Study Area

7.4.1 The spatial scope of the biodiversity assessment will take account of:

- The physical area of the Proposed Development;
- Nature of the baseline ecological conditions; namely the important ecological features (IEFs) (See **Section 7.10**); and
- Manner and extent to which effects upon IEFs may occur.

7.4.2 The biodiversity assessment will consider the likely effects of the Proposed Development on IEFs within the Proposed Development's Study Area¹ as defined in **Table 7.2**. These are based on current best practice guidelines published by the CIEEM (CIEEM, 2024) and applied professional judgement. It covers the Site of the Proposed Development and the wider landscape, acknowledging where potential pathways exist for the transfer of impacts away from the Site Boundary.

7.4.3 The sensitivity of ecological features present is also taken into account when determining the Study Area, as it will be greater where more sensitive ecological features are present.

7.4.4 The Proposed Development's Study Area has been determined by:

- Ecological data, including the use of online inventories of designated sites and habitats;
- Aerial photography and Ordnance Survey mapping, records of protected and notable species, and findings from field survey work;
- Consideration of the activities during construction and operation associated with the Proposed Development and the scale of the works; and

¹ For the purposes of this Scoping Report, the term Study Area is applied in lieu of the ecology specific term 'Zone of Influence' (ZOI) however accords to the same approach i.e. meaning this is the area over which IEFs could in principle be impacted by the Proposed Development.

- The duration and timing of these activities.

7.4.5 The Study Area applied is consistent for all phases of the Proposed Development.

Table 7.2 Biodiversity Study Area

Ecological Feature	Study Area Applied
Other Terrestrial Habitats including Invasive Non-Native Species (INNS)	Within 30m of the Site Boundary.
Mapped waterbodies and watercourses	Within 250m of the Site Boundary.
Habitats of Principal Importance (HPI) and woodland listed on the Ancient Woodland Inventory ² (AWI)	Within 1km of the Site Boundary.
Non-statutory Designated Sites – Local Wildlife Sites (LWS)	Within 2km of the Site
Protected and Notable Species	Within 2km of the Site Boundary.
Statutory Designated Sites – Site of Special Scientific Interest (SSSI), Local Nature Reserve (LNR) and National Nature Reserve (NNR)	Within 2km of the Site.
Internationally Designated Sites – Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site	Within 10km of the Site.

7.5 BNG Boundary

- 7.5.1 BNG is now a policy-level requirement embedded in the Energy National Policy Statement (NPS) via the biodiversity gain statement. Energy Development Consent Orders (DCOs) must demonstrably achieve $\geq 10\%$ net gain as a condition of consent, using a tailored Nationally Significant Infrastructure Policy (NSIP) framework focused on impacted habitats and robust evidence.
- 7.5.2 BNG will also become a statutory requirement for NSIPs which apply for a development consent order on or after 2 November 2026. The Proposed Development will therefore be subject to this requirement.
- 7.5.3 The BNG boundary is defined as the spatial extent of habitats that are impacted by the development, rather than the full extent of the Order Limits; it includes all habitats subject to temporary or permanent loss or deterioration as a result of the

² The AWI in England lists areas over 2 hectares (ha) in size which have been continuously wooded since at least 1600.

proposed works, and will be defined and agreed through the development of the BNG assessment.

7.6 Baseline Conditions

Establishing the Baseline Conditions

Desk Study

- 7.6.1 An ecological desk-study has been completed for the Site and Study Area following best practice guidelines (CIEEM, 2017). The search radii that defined the Study Area are provided in **Table 7.2**. Full details of the desk-study are detailed in **Volume 3, Appendix 7.1: Preliminary Ecological Appraisal**.
- 7.6.2 The desk-study has included a review of publicly available resources and data obtained from the following data sources have been (and will be) consulted to inform assessment of baseline ecological conditions:
- Department for Environment, Food & Rural Affairs (Defra). The Multi Agency Geographic Information for the Countryside (MAGIC) website (Defra, 2026);
 - Ancient Woodland Inventory (AWI) (Natural England, 2026);
 - Ancient Tree Inventory (Woodland Trust, 2026); and
 - Biological records received from RECORD (Biodiversity Information Centre for Cheshire, Halton, Warrington and Wirral) (RECORD, 2026).

Field Survey

- 7.6.3 A Preliminary Ecological Appraisal (PEA) survey including habitat mapping undertaken to UKHab guidance (UK Habitat Classification, 2023) was undertaken at the Site in May 2026. The results of the PEA and UKHab classification survey are summarised in this EIA Scoping Report and presented in full in **Volume 3, Appendix 7.1: Preliminary Ecological Appraisal**. This follows an earlier PEA survey that was undertaken in 2024 to support the CHP Phase 1 planning application.
- 7.6.4 In accordance with the Study Area distances for species and habitat features, a Survey Area was applied (**Table 7.3**). This Survey Area applied for field surveys sought to capture sufficient data on the extent of habitats within proximity to the Site. The PEA survey, in accordance with PEA approach (CIEEM, 2017) included an assessment of the potential of habitats or features suitable to support protected species e.g. woodland/scrub within potential to support badger *Meles meles* and trees/building for roosting bats (as outlined in **Table 7.7**).

- 7.6.5 Walking access to the Survey Area was subject to land access within the health and safety restrictions of the Site, which contains an operational oil refinery. However, adjacent habitats could be entirely viewed from adjacent walkways and internal roads.
- 7.6.6 As a result of the 2024 PEA survey submitted as part of the CHP Phase 1 TCPA application, a number of habitats and features were identified within the Survey Area that may have potential to support protected or notable species and could be subject to indirect effects from the Proposed Development. As such, additional surveys for badger, roosting bats, and otter and water vole *Arvicola amphibius* were undertaken. One of the aims of the 2026 PEA was to ascertain the validity of the 2024 PEA survey data for this Scoping Report, as well as making an assessment of the areas within and adjacent to the Proposed Development Red Line Boundary. The findings of this exercise are detailed within **Volume 3, Appendix 7.1: Preliminary Ecological Appraisal**.
- 7.6.7 Baseline surveys to fully determine the status of IEFs were completed in line with relevant current good practice guidelines (as summarised in **Section 7.3**). Where there are deviations from best practice, approaches to survey effort will be discussed with relevant consultees and survey methods and/or limitations detailed within the ES.
- 7.6.8 **Table 7.3** sets out the Survey Areas applied to the IEFs identified above (habitats, species and species groups), together with the justification for the distances used. For clarity, the Survey Area differs from the Study Area in that it defines the extent of field surveys and species-specific appraisals, rather than the wider desk-based assessment area. For details on how these differ please refer to **Table 7.2** and **Table 7.3**.

Table 7.3 Ecological survey extents

Ecological Feature	Survey Buffer Beyond Site Boundary	Justification
Badger	At least 30m (where suitable setts creating habitats are present)	Aligns to technical and legislative guidance when considering potential direct and indirect effects upon badgers and their setts (Protection of Badger Act, 1992; Roper, 2010).
Habitats	30m (includes the woodland and scrub to the south of the Site alongside Gale Brook, land north of the A5117 and east of Pool Lane)	Considered sufficient to inform the baseline habitat conditions.

Ecological Feature	Survey Buffer Beyond Site Boundary	Justification
Bats (roosting)	50m (where suitable roosting features are identified)	The habitats within the Site and Survey Area are considered to be of limited potential value for roosting bats due to the nature of the Site as an operational and highly lit industrial facility. However, assessments of buildings and trees within the Survey Area for their potential to support roosting bats was undertaken.
Aquatic habitats and species (macrophytes, fish (including European eel) and aquatic invertebrates)	200m (the maximum Survey Area for suitable watercourses which intercept the Site and upstream and downstream of the Site)	An aquatic walkover survey was undertaken in July 2026 across the aquatic elements of the Site, including watercourses, drains, ditches and other accessible aquatic habitats within and adjacent to the Site, and where possible up to 200m upstream and downstream of the Site boundary. Surveys focused on the River Gowy, Manchester Ship Canal, site drainage ditches, ponds and associated wetland features where access was available. Access to some aquatic habitats was restricted by operational activities within the refinery; however, sufficient representative habitat was accessible to enable a preliminary assessment of aquatic ecological constraints and opportunities.
Water vole and otter	250m (this is a maximum survey area for suitable watercourses which intercept the Site and upstream and downstream of the Site)	Aligns to technical guidance. Where significant barriers to habitat connectivity or watercourses are scoped out for suitability these will be excluded and justification provided (Dean <i>et al.</i> , 2016; Strachan <i>et al.</i> , 2011; Chanin, 2000).
Great crested newt (GCN) <i>Triturus cristatus</i>	250m	Given the context of the Site within the wider landscape and the presence of significant barriers to amphibian movement by land use and roads/watercourse a 250m radius is considered to be sufficiently robust. This aligns to guidance for typical GCN dispersal from a waterbody breeding site.

Existing Baseline

Designated Sites

7.6.9 The designated sites described within this Section are shown on **Volume 2, Figure 7.1: Designated Site Plan – Statutory** and **Volume 2, Figure 7.2: Designated Site Plan – Non-statutory**. Descriptions of designated and non-designated sites are provided in **Table 7.4** to **Table 7.6** below.

Table 7.4 Internationally Designated Sites within 10km

Designation	Approx. Distance from the Red Line Boundary	Summary of Features for Site Designation
Mersey Estuary SPA and Ramsar	0.7km north	The SPA and Ramsar (comprising of a total area of 5,023ha) is designated for the Annex I species golden plover <i>Pluvialis apricaria</i>. During winter, the Mersey Estuary SPA and Ramsar is of major importance for duck and waders. It contains species of conservation importance including redshank <i>Tringa tetanus</i>, shelduck <i>Tadorna tadorna</i>, teal <i>Anas crecca</i>, pintail <i>Anas acuta</i>, dunlin <i>Calidris alpina alpina</i>, black-tailed godwit <i>Limosa limosa islandica</i>.
River Dee and Bala Lake SAC	8.6km south The SAC extends a significant (> 25km) distance south and west of the Site	In addition, the River Dee and Bala Lake SAC is designated for the following Annex II species: 1160 Atlantic salmon <i>Salmo salar</i> and 1831 Floating water-plantain <i>Luronium natans</i>. The following Annex II species are present as a qualifying feature, but not a primary reason for site selection: 1095 sea lamprey <i>Petromyzon marinus</i>, 1096 brook lamprey <i>Lampetra planeri</i>, 1099 river lamprey <i>Lampetra fluviatilis</i>, 1163 bullhead <i>Cottus gobio</i> and 1355 otter.

Table 7.5 Nationally Designated Sites within 2km of the Site

Designation	Approx. Distance from the Red Line Boundary	Summary of Features for Site Designation
Mersey Estuary SSSI	0.7km north (the Site falls within the SSSI Impact Risk Zone (IRZ))	An internationally important site for wildfowl comprised of large areas of intertidal sand and mudflats. The Manchester Ship Canal forms part of the southern boundary of the Mersey Estuary SSSI and separates as series of pools. The Mersey Estuary SSSI contains

Designation	Approx. Distance from the Red Line Boundary	Summary of Features for Site Designation
		important roosting sites for large numbers of wildfowl and waders which feed on invertebrates contained within intertidal sediments. It also supports a number of important bird species including pintail, teal, shelduck, wigeon <i>Calidris alpina</i> , dunlin, Curlew <i>Numenius Arquata</i> , redshank and golden plover.

Table 7.6 Non-statutory Designated Sites within 2km of the Site

Designation	Approx. Distance from the Red Line Boundary at its closest point	Summary of Features for Site Designation
Gowy Meadows and Ditches LWS	40m south	Area of fields with an extensive interconnecting ditch system. Other habitats present include several small ponds, a section of river, hedgerows with mature trees and areas of swamp. Narrow strips of broadleaved woodland and poplar plantation are present, including black poplar <i>Populus nigra</i> . The Gowy Meadows and Ditches LWS hosts assemblages of red and amber list Birds of Conservation Concern (BoCC) species, plus populations of mammals and invertebrates.
River Gowy LWS	20m northwest	The River Gowy LWS comprises a substantial area of the River Gowy and its riparian banks, floodplain and tributaries to the north and the west of the Stanlow Manufacturing Complex (SMC). The River Gowy LWS has ornithological interest with records of red and amber BoCC list species, plus populations of mammals and invertebrates.
Station Road Railway Site LWS	300m northeast (at nearest point on the Red Line Boundary)	A disused former railway originally designated as Open Mosaic Habitat on Previously Developed Land (OMHPDL). Reptiles are potentially present within the Station Road Railway Site LWS.
Frodsham, Helsby and Ince Marshes LWS	800m northeast	The Frodsham, Helsby and Ince Marshes comprises an extensive area of coastal floodplain that is used for agricultural purposes. The site is of county, national and international ornithological importance for breeding, wintering and passage species, many of which are also qualifying features of the Mersey Estuary SPA and Ramsar site.

Designation	Approx. Distance from the Red Line Boundary at its closest point	Summary of Features for Site Designation
Wervin Meadows LWS	1.3km southwest	A 33ha area of grazed floodplain, adjacent to the River Gowy that provides habitat for ground nesting bird species and is a regionally important site for breeding lapwing <i>Vanellus vanellus</i> .
Shellway Road Pond South LWS	1km west	Large pond with fringing vegetation, planted trees and grassland.
Hoblane Ponds LWS	1.6km southeast	A small area of wetland approximately 0.2ha in size. Habitats include ponds and deciduous woodland.

HPI and Woodland Listed on the Ancient Woodland Inventory

- 7.6.10 Three areas of HPI are present within the Site. These are all lowland mixed deciduous woodland and occur to the east and west of the Site.
- 7.6.11 There are a number of HPI located within 1km of the Site including 28 parcels of deciduous woodland, 55 parcels of coastal and floodplain grazing marsh (the closest located approximately 49m south within Gowy Meadow and Ditches LWS), 16 parcels of mud flats (the closest located approximately 820m northwest), seven parcels of coastal saltmarsh (the closest located approximately 730m north) and six areas of open mosaic habitat.
- 7.6.12 No parcels of ancient woodland were recorded within 1km of the Site.

Habitats

- 7.6.13 The Site is currently occupied by a number of redundant buildings, plant and made ground. Areas of woodland, grassland and scrub were also encompassed by the Site Boundary but occurred more often in the wider Survey Area. The UKHab map is presented as **Volume 2, Figure 7.3: UK Habitat Plan**.
- 7.6.14 Thornton Brook is designated as a main river by the EA and extends within 30m of the Site's western boundary where it meets the River Gowy before crossing oil sites road. Several industrial waterbodies e.g. drainage or water storage tanks and concrete drainage channels are present within the habitat Survey Area (**Table 7.3**).
- 7.6.15 The Gale Brook is present within the habitat Survey Area and runs through the Site (**Volume 2, Figure 7.3: UK Habitat Plan**) and is hydrologically connected to the River Gowy approximately 80m west of the Red Line Boundary. Gale Brook

and the River Gowy are designated as main rivers under the jurisdiction of the EA. However, Gale Brook is not monitored against the objectives of the Water Framework Directive (WFD) and is not located within a WFD waterbody. Gale Brook enters the Site from an open section via a box culvert approximately 10m south of the Site, and crosses beneath the Site in a northerly direction via underground culverts. On the open sections, bankside vegetation of bramble *Rubus fruticosus*, reed canary grass *Phalaris arundinacea*, dock *Rumex sp* and nettle *Urtica dioica* was dominant. Further information on waterbodies and the hydrological environment is provided in **Chapter 10: Water Environment and Flood Risk** and is detailed in **Volume 3, Appendix 7.1: Preliminary Ecological Appraisal**.

Invasive Non-native (Plant) Species (INNS)

- 7.6.16 Five species of *Cotoneaster* are listed on Schedule 9 of the Wildlife and Countryside Act. Confirmation of the specific *Cotoneaster* species present within the Site would be required, and proposals for appropriate removal or treatment if the area of landscape planting were to be removed by the proposals.

Protected/Notable Species

- 7.6.17 **Table 7.7** below provides information of protected/notable species including data from the desk-study and field surveys (conducted to date).

Table 7.7 Protected and notable species

Feature	Desk Study	Initial Site Assessment	Evaluation
Badger	Seven records of badger within the Study Area, the nearest located approximately 40m south of the Site from October 2019.	During the 2024 field survey badger sett entrances were recorded within the woodland to the south of the Survey Area, with mammal pathways also present within the woodland. The closest sett entrance is located approximately 20m southeast of Site.	The Site itself provides limited suitability to support badger with areas of woodland in the northern and eastern extent of the site considered suitable for sett building and foraging.
Bats	Nine records of bat species within the Study Area were recorded by the desk study and this included three of the UK's 18 species of bat. These included common pipistrelle <i>Pipistrellus pipistrellus</i>, soprano pipistrelle <i>Pipistrellus pygmaeus</i> and an unidentified myotis species <i>Myotis sp.</i> The closest record to the Site was for two foraging common pipistrelles, located approximately 560m to the west in October 2021. There are no granted European Protected Species (EPS) licences	Habitats within the Site were of limited suitable to support commuting and foraging bats due to the high levels of noise and light disturbance from the SMC. The woodland areas and wider habitats to the south and east within the Survey Area would provide suitable habitat for roosting, commuting and foraging bats. During the 2024 Preliminary Roost Assessment (PRA) survey, two buildings (B1 and B7) located within and directly adjacent to the Site were assessed as having Low suitability to support roosting bats with Potential Roosting Features (PRFs) of gaps under the roof apex. All other buildings and structures within the Site and the Survey Area were recorded as having negligible suitability. No trees were	The tree and buildings with low suitability with potential roost features were subject to additional dusk emergence surveys in line with the Bat Conservation Trust guidance (Collins, 2023), which confirmed the likely absence of roosting bats from them in 2024. As a GLTA has not been completed in all areas of woodland within the Survey Area, the absence of roosting bats cannot be confirmed at this time. The Survey Area encompasses suitable habitats for commuting and foraging bats in the form of woodland and grasslands.

Feature	Desk Study	Initial Site Assessment	Evaluation
	relating to bats in place within the Study Area.	recorded within the Site with PRFs to support roosting bats. One tree located within the Survey Area. on the eastern bank of the Gale Brook was identified as having moderate potential for roosting bats. Following the results of additional dusk emergence surveys undertaken in June and July 2024, roosting bats are considered likely absent from the Survey Area. PRA surveys were undertaken on the TENKO Warehouse, Old Demin Plant and MP Boiler House in May 2026. These structures were not included within the 2024 survey effort. Each building was assessed as having Negligible suitability to support roosting bats. A full Ground Level Tree Assessment (GLTA) has not been undertaken for the woodland parcels within the Survey Area.	
Breeding and wintering birds	878 records of priority and notable bird species within the Study Area, the nearest being for house sparrow <i>Passer domesticus</i> approximately 160m to the south in March 2020.	Habitats within the Site have limited suitability to support breeding and wintering birds. However, the designated sites in proximity to the Proposed Development such as Gowy Meadows LWS are considered to offer habitat suitable for a range of breeding and wintering birds.	The Site itself does not provide suitable habitat to support a significant assemblage of breeding or wintering birds of any ornithological significance. Common and widespread species are likely to use the isolated areas of woodland, scrub and grassland. Whilst this nesting habitat is present within

Feature	Desk Study	Initial Site Assessment	Evaluation
			the Survey Area it is not considered warranted to conduct detailed breeding or wintering bird surveys to inform the ES.
Great crested newt (GCN) <i>Triturus cristatus</i>	The desk study returned 17 records of GCN within the Study Area, the closest being approximately 1.5km northwest in October 2021.	Thornton Brook and Gale Brook are both designated as main rivers by the Environment Agency and extend along the western boundary and culverted under the SMC, respectively. Within 250m, there is an artificial drainage tank and channel, which were all non-naturalised and associated with the SMC with steep concrete sides. Hibernacula features are present within the Survey Area, e.g. brick and rubble piles.	Given the lack of suitable terrestrial habitat within the Site, it is considered to provide negligible suitability to amphibians. Whilst there were hibernacula features present within the Survey Area, which could provide suitable habitat for hibernating amphibians, given the absence of suitable breeding waterbodies within 250m of the Site and significant barriers to dispersal the presence of terrestrial GCN is unlikely.
Notable plants and INNS	Five records of black poplar within the Study Area were returned by the desk study, the closest being approximately 200m to the south. One record of eastern grey squirrel <i>Sciurus carolinensis</i> within the Study Area was returned by the desk study, approximately 1.4km to the northwest.	Stands of <i>Cotoneaster spp</i> were present within the Site located to the south within the small area of modified grassland and ornamental planting. The <i>Cotoneaster sp.</i> was also present within the woodland to the south of the Survey Area.	INNS should be considered present within the Site until the exact species of <i>Cotoneaster</i> is confirmed. If the species is one of the five listed in the Wildlife and Countryside Act 1981 then a specialist INNS contractor should be appointed.

Feature	Desk Study	Initial Site Assessment	Evaluation
Reptiles	The desk study data did not return any records of reptile species within 2km of the Site.	The Site does not support suitable habitat for reptiles. Habitats present within the wider Survey Area i.e. scrub, woodland and Gale Brook provide limited opportunity for reptiles. The rubble and brick piles within the Survey Area provide low potential hibernacula for reptiles.	The Site is isolated given its context within the SMC. Whilst there are minor linkages to the habitat further south, the barrier effect of the road network is likely to prevent the free movement of reptiles onto, and around, the Site. Given the historical operational use of the Site and lack of any significant areas of foraging habitat, it is considered that reptiles do not represent an ecological constraint to the Proposed Development.
Otter <i>Lutra lutra</i>	Ten records of otter within the Study Area. The closest of these records was located approximately 515m to the west in Thornton Brook (tributary to the River Gowy) from 2014.	No habitats are present within the Site to support otter. The section of Gale Brook located to the south of the Site is considered to be sub optimal for otter.	The Site is isolated given its context within the SMC with limited opportunity for holt creation, lack of linkages to foraging opportunities (either within the brook or elsewhere).
Water vole <i>Arvicola amphibius</i>	Six records of water vole within the Study Area, the closest being approximately 155m to the south in September 2015.	Habitats present within the Site provide no foraging, commuting or burrowing opportunities for water vole. Gale Brook to the south of the Survey Area provides suitable foraging and commuting habitat for water vole, with the banks also providing some burrowing suitability. During the field survey, a potential water vole burrow was recorded on the eastern bank of the Gale Brook. No other evidence	The species-specific water vole surveys which were undertaken confirmed the likely absence of water vole from the Survey Area.

Feature	Desk Study	Initial Site Assessment	Evaluation
		was recorded. Water vole surveys comprising of a spring and autumn surveys were subsequently undertaken in line with best practice guidance. These surveys did not record any field signs of water vole within the Survey Area and they are therefore considered likely absent.	
Freshwater fish	Data from the Environment Agency Ecology and Fish Data Explorer (Defra, 2021) returned a record from 2022 detailing a catch depletion electric fishing survey from the River Gowy approximately 4km south of the Proposed Development (National Grid Reference SJ 44925 71043). This survey identified seven species including, gudgeon <i>Gobio gobio</i> , chub <i>Leuciscus cephalus</i> , European eel, bullhead <i>Cottus gobio</i> , dace <i>Leuciscus leuciscus</i> , stone loach <i>Barbatula barbatula</i> and 3-spined stickleback <i>Gasterosteus aculeatus</i> . In 2024, four	There are no habitats within the Site to support freshwater fish. Gale Brook is present to the south of the Survey Area and is considered of limited suitability to support freshwater fish. As Gale Brook is hydrologically connected to the River Gowy the presence of freshwater fish, including eel cannot be ruled out following the initial Site assessment	Whilst it is not currently considered that the Study Area would support significant populations these species groups, further details of the Proposed Development will determine if there is the potential for impacts to hydrological features such as Gale Brook. Once further details of the design is available an assessment of likely impacts to hydrological receptors can be identified and determine the requirement to undertake additional aquatic/fish surveys.

Feature	Desk Study	Initial Site Assessment	Evaluation
	species were recorded including gudgeon, European eel, bullhead and 3-spined stickleback.		
Aquatic macroinvertebrates	Data from the Environment Agency Ecology and Fish Data Explorer (Defra, 2021) returned records from the River Gowy, approximately 0.5km west of the Proposed Development (NGR SJ 43120 74589). No species of conservation interest were returned in the data. However, two INNS were recorded, the New Zealand mud snail <i>Potamopyrgus antipodarum</i> and the killer shrimp <i>Dikerogammarus villosus</i>. Further data were returned from the River Gowy, approximately 3.7km south of the Proposed Development (NGR SJ 44787 71134). In 2021, one species of conservation interest, the riffle beetle <i>Oulimnius troglodytes</i> was recorded. This species is	There are no habitats within the Site to support aquatic macroinvertebrates. The Gale Brook is present to the south of the Survey Area and provides suitable habitat to support aquatic macroinvertebrates.	It is likely that Gale Brook will support aquatic macroinvertebrates adapted to ditch habitat. It should be noted that Gale Brook is culverted beneath the Site, however, a small section of exposed watercourse is present in the Survey Area to the south of the Site. Although, a Nationally Scarce riffle beetle was returned in the desk study data from the River Gowy, it is unlikely that the ditch habitat within Gale Brook would support this species as they are adapted to shallow, fast flowing riffle habitat.

Feature	Desk Study	Initial Site Assessment	Evaluation
	not a Red List species but is considered Nationally Scarce. In 2024, two INNS, the freshwater amphipod <i>Crangonyx pseudogracilis/floridanus</i> agg. and the New Zealand mud snail were recorded. Previously in 2021 two further INNS were identified, the killer shrimp and the demon shrimp <i>Dikerogammarus haemobaphes</i>. No aquatic macroinvertebrate species that are listed on Schedule 5 of the Wildlife and Countryside Act 1981 or listed as Species of Principal Importance under the Natural Environment and Rural Communities Act 2006 were recorded in the desk study data.		
Macrophytes	The desk study returned data from Thornton Brook, a tributary of the River Gowy. This watercourse is approximately 30m west of the Proposed Development	There are no habitats within the Site to support macrophytes. The Gale Brook to the south of the Survey Area has the potential to support macrophyte species, however during the survey macrophyte cover was low.	Gale Brook is suitable for supporting macrophyte species. Reed canary grass <i>Phalaris arundinacea</i> was recorded during habitat surveys within the channel of Gale Brook, north of the

Feature	Desk Study	Initial Site Assessment	Evaluation
	at its closest location, however, the desk study records were returned from a length of the watercourse 1km south (NGR SJ 43170 73977). In 2022, 23 macrophyte species were recorded including one species of conservation interest, the water violet <i>Hottonia palustris</i> which is listed as Vulnerable on the Vascular Plant Red List for England. One INNS, the Canadian pondweed <i>Elodea canadensis</i> was also recorded. No macrophyte species were identified in the desk study that are listed under the Habitats Regulations, as a Species of Principal Importance under the Natural Environment and Rural Communities Act 2006 or on Schedule 8 of the Wildlife and Countryside Act 1981.		A5117 in an area of woodland, south of the Site boundary.

Degradation

- 7.6.18 Habitats within the Site may have degraded over time, as a result of other activities carried out. The BNG assessment will identify any areas of degradation and determine whether the biodiversity value of the habitat prior to degradation should be considered within the baseline for the BNG boundary.

Future Baseline

- 7.6.19 The future baseline assumes that existing industrial use within the Site would remain should the Proposed Development not proceed. It is unlikely that climate change or variations in habitat condition or species distribution as a result of future climate changes would result in a significant change in the future ecological baseline conditions of the Site.
- 7.6.20 There is potential that areas around the Site but within the wider SMC may change in type of industrial use and operational activity levels over time subject to economic and other associated factors. However, overall it is assumed that the SMC operations would continue within the Site, and the Site would remain predominantly hard standing and of limited ecological value. The wider SMC will continue to be operational, with some construction activities taking place for the other developments being brought forwards within the SMC (as described in **Chapter 1: Introduction**).

Sensitive Receptors

- 7.6.21 The sensitive receptors foreseeable at this stage are detailed in **Table 7.8**. The quantity and extent of sensitive receptors may be subject to change based upon the results of the ongoing surveys.

Table 7.8 Summary of sensitive ecological features

Feature Type	Specific IEF	Location Relative to Site Boundary
Internationally Designated Sites	- Mersey Estuary SPA and Ramsar - River Dee and Bala Lake SAC	0.7km north (at nearest point on the Red Line Boundary) 8.6km south (at nearest point on the Red Line Boundary)
Nationally Designated Sites	Mersey Estuary SSSI	0.7km north (at nearest point on the Red Line Boundary) (Site falls within SSSI IRZ)
Locally Designated Sites (non-statutory)	Gowy Meadows and Ditches LWS	40m south (at nearest point on the Red Line Boundary)

Feature Type	Specific IEF	Location Relative to Site Boundary
	River Gowy LW	20m northwest (at nearest point on the Red Line Boundary)
HPI	Lowland mixed deciduous woodland.	10m west (at nearest point on the Red Line Boundary)
Protected/Notable Species	Badger, otter, water vole, European eel, and roosting bats.	Within Site and Survey Area.
INNS	<i>Cotoneaster</i> sp. recorded	Within Site and Survey Area.

7.7 Mitigation Measures

Overview

- 7.7.1 Where possible, habitats of biodiversity value will be retained and avoided as part of the Proposed Development. Where this is not possible, mitigation and/or compensation measures would be explored. For example, via the provision of offsite habitat improvements which will be required as part of the BNG assessment. Full details regarding mitigation measures will be provided in the ES chapter.
- 7.7.2 Monitoring requirements will also be explored, and requirements determined once detailed Proposed Development designs are known and the assessment has been undertaken in the ES. Mitigation and/or monitoring will be captured within the Outline Code of Construction Practice (CoCP) or longer term Site Management Plan(s) or equivalent to the Proposed Development.
- 7.7.3 Where features of habitats supporting protected species cannot be entirely avoided and protected, and potential effects are predicted on legally protected species, the assessment will outline where relevant derogation licensing i.e. NE licences are required to implement mitigation measures e.g. loss of a bat roost or closure or disturbance to a badger sett.
- 7.7.4 With regard to habitat compensation and enhancement, the principles of BNG will be applied and a BNG Assessment undertaken and provided alongside the ES.

Construction Phase

- 7.7.5 A number of embedded mitigation measures will be considered as part of the developing design, including:
- Retain habitats of high biodiversity value, where practicable, in alignment with the mitigation hierarchy;

- Retained trees must be protected in accordance with BS: 5837:2012 BSI (2012); and
- Potential need for habitat creation and replacement (to be confirmed following the BNG Assessment).

7.7.6

During the site clearance, pre-construction and construction phases, mitigation measures to address potential ecological effects would include those listed below. These embedded mitigation measures would be captured within the Outline CoCP, including:

- use of appropriate buffer zones to avoid direct impacts e.g. to trees or significant disturbance to wildlife and their habitats, e.g. any active badger setts, bat roosts;
- completion of pre-work checks within woodland and scrub for the presence of badger, prior to commencement of work;
- precautionary vegetation clearance in the presence of an ecological clerk of works, where necessary, to avoid significant impacts to protected species;
- timing of works to avoid sensitive periods for certain species, e.g. avoiding clearance of suitable bird nesting habitat during nesting season enabling its safe removal;
- backfilling of any excavations within the same day to avoid the entrapment of wildlife, or the use of barriers/fencing to avoid entrapment;
- the selection of quiet and low/noise/vibration equipment and methodologies. where practicable. i.e. driven piles shall not be employed for this reason;
- best practice measures for pollution prevention to minimise impacts on surrounding habitats (including water quality), such as the creation of suitable of drainage;
- a sediment control plan (or equivalent) to reduce the quantity of sediment entrained in runoff. this will include measures such as settlement lagoons and/or silt filters;
- preparation and implementation of a management and maintenance plan for the new surface water drainage system throughout the lifetime of the proposed development and no release of site-generated surface water runoff or foul discharge to ground;
- dust suppression measures; and
- the use of sensitive lighting where any night works or nighttime lighting is required.

Operational Phase

7.7.7 Relevant design, mitigation and enhancement measures will be identified in the ES, and these may include:

- managing operations in order to avoid or minimise indirect effects, and minimising direct effects arising from land take in order to reduce the potential for Likely Significant Effects (LSEs); and
- adherence to relevant Environmental Permits, Best Practice Guidance and Regulations, British Standards, and monitoring for the protection of IEFs.

7.8 Scope

7.8.1 A summary of the proposed scope for the biodiversity construction and operational phase assessments is presented in **Table 7.9**.

Table 7.9 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Potential for pollution emissions or increased noise, which may indirectly affect designated Sites – National and International and their qualifying features of interest.	Construction and Operational	✓		The Study Area includes the following designated sites: - Mersey Estuary SPA and Ramsar; - River Dee and Bala Lake SAC; and - Mersey Estuary Site of Special Scientific Interest SSSI. The potential therefore exists for indirect impacts (e.g. pollution events) on designated sites. The Mersey Estuary SPA and Ramsar is located 0.7km to the north of the Site, which are both designated due to the large wintering bird assemblages present. It is assumed unlikely that the bird populations present would also be present within the Site. A HRA Screening assessment has been undertaken to inform the DCO application and will be submitted concurrently with the biodiversity assessment to fully assess the LSE upon the National Network Sites.
Indirect impacts e.g. changes to local hydrological conditions, generation of dust and increased noise and vibration upon Non-statutory Designated Sites	Construction and Operational	✓		Gowy Meadows and Ditches LWS and the River Gowy LWS are located approximately 43m south and 20m northwest of the Site respectively. The potential therefore exists for indirect impacts upon these LWS during construction and operation e.g. changes to local hydrological conditions, generation of dust and increased noise and vibration during the construction phase of the Proposed Development.

Element	Phase	Scoped In	Scoped Out	Justification
Indirect impacts from localised generation of dust impacting HPI.	Construction and Operational		✓	No HPI are present within the Site. Areas of HPI Lowland Mixed Deciduous Woodland present adjacent to the east of the Site will not be lost to facilitate the Proposed Development. The areas of OMHPDL that were identified in the desk study did not meet the necessary criteria to be classified as this habitat following the Site survey (Volume 3, Appendix 7.1: Preliminary Ecological Appraisal). Based on the above, embedded mitigation measures can be incorporated into Proposed Development in relation to potential indirect disturbance impacts (such as dust) to minimise impacts to the lowland mixed deciduous woodland and therefore it can be considered that HPI can be scoped out.
Potential for indirect impacts (e.g. vibration or noise disturbance which may have an impact upon badger.)	Construction and Operational	✓		Habitats within the Site are limited in their suitability to support badger and no evidence of their presence was identified within the Site. However, evidence of badger including setts were recorded in habitat within proximity to the Site. The Site Boundary is within 20m of a potential badger sett and due to the mobile nature of badgers additional setts may be excavated in close proximity to the Site prior to construction commencing. In the absence of appropriate mitigation there could therefore be direct physical impacts to badger (e.g. sett loss) as well as the potential for indirect impacts (e.g. vibration or noise disturbance) to resident badger during the construction phase.

Element	Phase	Scoped In	Scoped Out	Justification
				Potential indirect effects (e.g. light spill, noise and disturbance) may have an impact upon badger during the operational phase of the Proposed Development
Bats (roosting)	Construction and Operational	✓		In 2024, one building within the Site and a second adjacent to the Site were assessed as Low suitability to support roosting bats and one tree was also present with suitability for roosting bats. While subsequent bat surveys concluded that roosting bats were likely absent from these, due to the length of time which is expected to elapse prior to construction beginning the continued absence of roosting bats cannot be assumed. Chapter 2 – The Proposed Development includes details of the buildings due to be demolished as part of the Proposed Development. A PRA has been undertaken for buildings on the Site in both 2024 and 2026. The 2026 Preliminary Bat Roost Assessment (PBRA) focused on the TENKO Warehouse, Old Demin Plant and MP Boiler House. Each of these buildings was assessed as having negligible suitability to support roosting bats (Volume 3, Appendix 7.1: Preliminary Ecological Appraisal). Furthermore, a complete GLTA of the wider areas of woodland within the Site due to the 2026 boundary change has not been undertaken. Additional surveys will be required and the status and potential effects upon roosting bats will be a consideration in the Ecological Impact Assessment (EclA) and are therefore scoped in.

Element	Phase	Scoped In	Scoped Out	Justification
Bats (non-roosting)	Construction and Operational		✓	Although there are some suitable areas beyond the Site that may offer commuting and foraging habitat for bats, these are also not expected to be directly affected by the Proposed Development. Habitats within the Site are of limited value for foraging bats with high levels of lighting and no features to provide prey sources or likely commuting routes. Based on the above, embedded mitigation measures can be incorporated into Proposed Development in relation to potential indirect disturbance impacts (such as light spill). It is therefore considered that non roosting bats can be scoped out.
Birds	Construction and Operational	✓		There is limited suitable habitat for breeding and wintering birds within the Site; small sections are present within the modified grassland and scrub to the south of the Site that would be suitable for nesting birds. It is anticipated that these habitats will be lost to facilitate the Proposed Development and therefore may be potential direct effects to birds (e.g. loss of nests). Habitats within the wider Survey Area such as woodland or shrub, are more suitable however are not anticipated to be directly impacted by the Proposed Development. Site clearance and construction could result in direct loss of nesting and/or overwintering habitat, including the potential killing or injury of nesting birds. In addition, disturbance could be incurred as a result of noise, vibration and visual impacts during the construction and operational phases.

Element	Phase	Scoped In	Scoped Out	Justification
Great crested newt	Construction and Operational		✓	There is limited suitable terrestrial and aquatic habitat present onsite to support amphibians including great crested newt. It is noted following the consultation response received from CWCC that there was a historical population of GCN to the east of the Site. However, the lack of connectivity across the Site in combination with the only waterbodies having limited suitability for GCN that they are likely absent from the Site. It is also noted that in addition, the Site is subject to ongoing and prolonged disturbance as a result of the wider SMC. Multiple hibernacula were present across the Survey Area, which could potentially be utilised by hibernating amphibians, but none within the Site. Based on the records provided by the desk-study and the field survey, habitats within the Site are unlikely to support great crested newt and therefore are scoped out of the assessment.
Reptiles	Construction and Operational		✓	The habitats present within the Site were unsuitable to support reptiles. There is negligible potential for habitats within the Survey Area to the south of the Site to support common species of reptile. The habitats are isolated by barriers to dispersion, lack of mosaic of habitats and no records provided by the desk-study), these areas are outside the Site Boundary and will not be impacted by the Proposed Development. Therefore, impacts to reptiles are proposed to be scoped out.

Element	Phase	Scoped In	Scoped Out	Justification
Otter	Construction and Operational		✓	No habitats are present within the Site to support otter. The section of Gale Brook located to the south of the Site is considered to be sub-optimal for otter. This is due to isolated and disturbed nature and limited opportunity for holt creation, lack of linkages to foraging opportunities (either within Gale Brook or elsewhere).
Water vole	Construction and Operational	✓		On-site habitats are largely unsuitable to support water vole. Gale Brook is present to the south of the Site and was assessed as being suitable to support foraging and burrowing water vole. Further species specific surveys subsequently confirmed the likely absence of water vole from the section of Gale Brook within the Survey Area. However, the desk study confirmed the presence of water vole 155m south of the Site in Gowry Meadows. Given the hydrological connections of Gale Brook to this area the continued absence of water vole cannot be assumed. Activities during the construction phase may result in indirect disturbance, including lighting, visual and noise disturbance, which may negatively affect water vole.
Freshwater fish	Construction and Operational	✓		During the construction phase temporary short term disturbance and/or displacement of fish populations, including European eel, in Gale Brook could occur. Fish populations could also be at risk from the accidental release of water-borne pollutants from the Site. As a result, freshwater fish have been scoped into this assessment.

Element	Phase	Scoped In	Scoped Out	Justification
Aquatic macroinvertebrates	Construction and Operational	✓		Temporary short term disturbance and/or displacement of aquatic macroinvertebrate populations in Gale Brook could occur. Aquatic macroinvertebrates could also be at risk from the accidental release of water-borne pollutants from the Site. As a result, aquatic macroinvertebrates have been scoped into this assessment.
Macrophytes	Construction and Operational	✓		Macrophytes could be at risk from the accidental release of water-borne pollutants from the Site. As a result, macrophytes have been scoped into this assessment.

7.9 Assessment Methodology

- 7.9.1 **Chapter 3: Approach to EIA** outlines the general assessment methodology for the EIA. This section details how this methodology will be applied and modified to meet the specific requirements of the biodiversity assessment to be presented in the ES.
- 7.9.2 The assessment will include the following for each ecological feature proposed to be scoped into the assessment:
- Determine the importance of ecological features affected, through survey and/or research;
 - Assess impacts potentially affecting important features;
 - Characterise the impacts by describing their extent, magnitude, duration, reversibility, timing and frequency;
 - Identify cumulative impacts (as detailed in **Chapter 19: Cumulative Effects**);
 - Identify significant effects of impacts in the absence of any mitigation;
 - Incorporate measures to avoid and mitigate (reduce) these effects;
 - Assess the significance of any residual effects after mitigation;
 - Identify appropriate compensation measures to offset significant residual effects (if any); and
 - Identify opportunities for ecological enhancement.
- 7.9.3 For adverse impacts, the methodology classifies the magnitude of impacts by a matrix approach to determine significance of effects. This methodology will be used to assess both the construction and operational phases of the Proposed Development.

Significance Criteria

- 7.9.4 In determining the significance of a potential effect, the magnitude of change arising from the Proposed Development is correlated with the value/sensitivity of the particular environmental receptor or process under consideration. Further detail is provided below.

Magnitude

- 7.9.5 The magnitude relates to the level of change that the receptor will be receiving compared to the baseline conditions, using the duration of the impact, timing,

scale, size and frequency to determine the magnitude of the impact to each receptor.

7.9.6 Magnitude of impact is evaluated in accordance with the definitions set out in **Chapter 3: Approach to EIA**.

7.9.7 The following characteristics will be used to assess the magnitude of the impact on ecological features as a result of the Proposed Development:

- Type of impact – positive or negative;
- Extent or spatial scope of the impact;
- Reversibility of impact – whether the impact is naturally reversible or reversible through mitigation measures;
- Timing and frequency of the impact, in relation to ecological changes; and
- Likely duration of the impact – short term (< 1 year), medium term (1 - 5 years) or long term (5 or more years).

Table 7.10 Biodiversity definitions of impact magnitude classes

Magnitude of Impact	Definition
High	Total loss or large alteration to key elements/features of the baseline conditions.
Medium	Partial loss or alteration to one or more key elements/features of the baseline conditions.
Low	Small shift away from baseline conditions.
Very Low	Very slight change from baseline conditions.

Value and Sensitivity

7.9.8 As described within **Chapter 3: Approach to EIA**, sensitivity measures how affected receptors/processes and/or the receiving environment is likely to respond to change. The sensitivity is assigned at the receptor/process level. This may be defined in terms of quality, value, rarity or importance, and be classed as International, UK/National, Regional/County, District, Local.

7.9.9 **Table 7.11** summarises the ecological feature conservation value and/or sensitivity adapted from CIEEM's Guidelines for EclA for habitats and species (CIEEM, 2024), which has been adapted for use in this assessment. This

guidance uses the term “Importance” to reflect value and sensitivity, and this term has been adopted.

Table 7.11 Biodiversity description of value and sensitivity

Value/Sensitivity	Criteria
International (High)	Habitats: An internationally designated site or candidate site SPA, candidate SPA, SAC, candidate SAC, SCI, Ramsar Site, Biogenetic/Biosphere Reserve, World Heritage Site) or an area that would meet the published selection criteria for designation. A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. Species: A sustainable population of an internationally important species or species listed as occurring in 15 or fewer 10km squares in the UK, which relates to categories 1 and 2 in the UK Biodiversity Action Plan (UK BAP), that is listed in Annex IV of the Habitats Directive, or as being of unfavourable conservation status in Europe, of uncertain conservation status, or of global conservation concern in the UK BAP. Sites supporting a breeding population of such a species or supplying a critical element of their habitat requirements.
UK/National (High)	Habitats: A nationally designated site, SSSI, NNR, Marine Nature Reserve or a discrete area that would meet the published selection criteria for national designation (e.g. SSSI selection guidelines). A sustainable area of a priority habitat identified in the UK BAP, or of smaller areas of such habitat, which are essential to maintain the viability of a larger whole. Areas of HPI, Ancient Woodland or Wood Pasture and Parkland HPI. Species: Any regularly occurring or large population of a nationally important species such as those defined by the International Union for Conservation of Nature and Natural Resources (IUCN) in the Red List of Threatened Species (IUCN, 2025). A large population of a species identified as a SPI. A species population that would qualify for SSSI designation.

Value/Sensitivity	Criteria
Regional/County (Medium)	Habitats: Viable areas of key habitat identified in county/district BAPs, or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Sites recognised by local authorities, e.g. LWS. County sites that the designating authority has determined meet the published ecological selection criteria for designation. A diverse and/or hedgerow network comprised of mostly Important Hedges. Degraded areas of HPI (excluding Wood Pasture and Parkland HPI and Ancient Woodland Lowland Mixed Deciduous Woodland HPI that is Ancient Woodland). Species: A regularly occurring, locally significant number of a nationally important species. Any regularly occurring, locally significant population of a SPI or a species listed in a county/district BAP (where available). A regularly occurring, locally significant population of a county/district important species. Sites supporting populations of internationally/nationally/regionally important species that are not threatened or rare in the region or county, and not integral to maintaining those populations. Sites/features scarce in the county or that appreciably enrich the county habitat resource.
District (Low)	Habitats: Areas of habitat that appreciably enrich the local habitat resource (e.g. species-rich hedgerows, ponds). Sites that retain other elements of semi-natural vegetation that, due to their size, quality or the wider distribution within the local area, are not considered for the above classifications. Species: Populations/assemblages of species that appreciably enrich the biodiversity resource within the local context. Sites supporting populations of county/district important species that are not threatened or rare in the region or county, and are not integral to maintaining those populations.
Local (Very Low)	Habitats: Common and widespread habitat, not meeting any of the above criteria. Areas of heavily modified or managed vegetation of low species diversity or low value as habitat to species of nature conservation interest. Species: Common and widespread species, not meeting any of the above criteria. Commonplace feature of little or no habitat/historical significance. Loss of such a feature would not be seen as detrimental to the ecology of the area.

Significance

- 7.9.10 The overall significance will be assessed using the matrix shown in **Table 7.12**, which has been modified to align with **Chapter 3: Approach to EIA**. This uses sensitivity of the receptor and magnitude of change to determine significance. Where a range of significance of effect is identified the final assessment for each effect is based upon professional judgement.
- 7.9.11 In accordance with **Chapter 3: Approach to EIA**, any effects with a significance level of Moderate or above will be concluded to be significant.

Table 7.12 Magnitude of impacts

Value/Sensitivity	Magnitude of Impacts				
		High	Medium	Low	Negligible
	International (High)	Major	Major to Moderate	Moderate	Negligible
	UK/National (High)	Major	Major to Moderate	Moderate	Negligible
	Regional/County (Medium)	Major to Moderate	Moderate	Minor to Moderate	Negligible
	District (Low)	Moderate	Minor to Moderate	Minor	Negligible
	Local (Very Low)	Minor	Minor	Negligible	Negligible

Description of Likely Significant Residual Effects

Construction Phase

- 7.9.12 The potential residual effects associated with the construction phase may include:
- Minimal non-HPI habitat loss within the Site (amenity grassland and scrub);
 - Indirect effects (increased noise, vibration, dust, air quality changes and water quality and quantity changes) resulting in potential effects upon designating features of designated sites and species located within the Study Area; and
 - Increased lighting, which may lead to disturbance of nocturnal species.

Operational Phase

- 7.9.13 The potential residual effects associated with the operational phase may include:

- disturbance to species as a result of noise and vibration from the operation of the Proposed Development;
- disturbance to species as a result of maintenance activities during the operational phase;
- lighting that may lead to disturbance of nocturnal species; and
- changes in air quality from operational emissions which may lead to effects on habitats and species.

Other Assessments

7.9.14 The approach to other assessments, where required, including the Habitats Regulations Assessment Screening, the Report to Inform Appropriate Assessment, and the Biodiversity Net Gain Assessment are described in **Chapter 3: Approach to EIA**.

7.10 Assumptions and Limitations

7.10.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- Where access restrictions within the Study Area or Survey Area prevent a full ecological baseline assessment, a precautionary principle will be applied to the assessment (and has been for this Scoping assessment) of any IEFs. The precautionary principle will assume a 'reasonable worst case' scenario informed by professional experience and knowledge, desk-based information and field-based evidence (where available) for any feature/receptor unable to be accessed or fully surveyed.
- Records held by local biological record centres and local recording groups are generally collected on a voluntary basis. Therefore, the absence of records does not demonstrate the absence of species, it may simply indicate a gap in recording coverage.
- Ecological survey data are typically valid for two years unless otherwise specified, for example if conditions are likely to change more quickly due to ecological processes or anticipated changes in management. Any delays to completion of the scope of surveys outlined above may therefore require update surveys to be completed to ensure that any findings presented as part of the ES are valid.

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EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 8: Cultural Heritage**

02-09-2026

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8. Cultural Heritage

8.1 Introduction

- 8.1.1 This chapter considers the potential impacts of the Proposed Development on cultural heritage during the construction, operational (including maintenance) and demolition phases. It sets out the proposed methodology for the cultural heritage assessment and identifies impacts that can be scoped out of the Environmental Impact Assessment (EIA).
- 8.1.2 Statutory provision for the safeguarding of heritage assets has been made at a national and local level. Heritage assets comprise below and above ground archaeological remains, buildings, structures, monuments or heritage landscapes.
- 8.1.3 This Scoping chapter is supported by a technical appendix in the form of a fully illustrated Heritage Statement (HS) (**Volume 3, Appendix 8.1: Heritage Statement**). The HS has included a detailed baseline compiled through a broad and standard range of data sources, including the Historic England National Heritage List for England (NHLE), the Historic Environment Record (HER), local authority data sources along with published works and cartographic sources. This chapter has been informed by a site walkover to consider potential impacts to their setting (e.g. visible changes to historic character and views).
- 8.1.4 An assessment of the likely palaeoenvironmental potential within the Site has also been considered in a technical note (**Volume 3, Appendix 8.2: Heritage Technical Note**).
- 8.1.5 It is proposed that impacts on buried archaeological remains be scoped out of the EIA, and no further desk-based or impact assessment is required to assess this. Justification for this position is provided within **Section 8.6** of this chapter.
- 8.1.6 Impacts during operation on the setting of built heritage assets will be scoped into the EIA due to the potential for adverse impacts.
- 8.1.7 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.

8.2 Consultation and Engagement

- 8.2.1 Engagement undertaken for Phase 1 of the Combined Heat and Power (CHP) development, which is a precursor to Phase 2 (the Proposed Development), is summarised in **Table 8.1**. Phase 1 comprises a Town and Country Planning Act regime application for the CHP, with determination anticipated later in 2026. The

engagement undertaken on Phase 1 to date is relevant to the scoping of Phase 2 as it has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the subsequent phase of the project.

- 8.2.2 It is anticipated that feedback in relation to this topic and the scope of works will be gained as part of the Proposed Development EIA Scoping Opinion, and this will inform the production of the Environmental Statement (ES).

Table 8.1 Consultation and engagement to date

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
County Archaeologist Cheshire West and Chester Council (CWCC)	4 November 2024	CWCC advised that while there are no archaeological concerns that would trigger their inclusion for further assessment as part of this EIA, there may be potential for palaeoenvironmental remains, potentially alluvium and peat, which border the southern boundary of the Mersey Estuary. It was advised that given planned intrusions up to 3m deep, a condition for archaeological observation and recording during certain aspects of the development may be appropriate. In response to this comment a technical note was produced to assess the presence and extent of alluvium and peat deposits within the Site and assess the potential for impacts on these deposits based on the construction depth. A technical note was produced to assess the potential for excavations to impact the deposits of palaeoenvironmental potential within the Site. The technical note concluded that peat and alluvium deposits were recorded at depths of 3.9m to 5.0m below ground level, beyond the maximum construction depth of 3.0m. As a result, no impact is anticipated, and no further archaeological investigations are proposed.
Built Environment Officer (Conservation and Design) CWCC	7 November 2024	CWCC advised that whilst it may be possible to scope out above-ground heritage assets, as there are no non-designated heritage assets within the Site, it would be useful to include a statement on whether a site inspection has been carried out to confirm there are no non-designated heritage assets affected. CWCC

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
		commented that as Stanlow has been in operation for 100 years, there may be significant features hitherto not known about due to the restrictions of the Site. Following the EIA Scoping Opinion (24/03305/SCO), an assessment of potential effects deriving from changes to the setting of designated heritage assets was produced, supported by a Heritage Statement. No site inspection has been carried out as it was not deemed necessary considering the industrial nature of the Site. There are no heritage assets of any notable significance within the Site, which has been heavily developed since the foundation of the SMC.

8.3 Guidance

8.3.1 This chapter has, and when undertaken the ES chapter will, consider the following guidance:

- Chartered Institute for Archaeologists (CIfA): Regulations for professional conduct (CIfA, 2019; revised 2025);
- CIfA Standard and guidance for historic environment desk-based assessment (CIfA ,2020a);
- CIfA Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (CIfA, 2020b);
- Good Practice Advice (GPA) 2 – Managing Significance in Decision-taking (Historic England, 2015);
- GPA 3 – The Setting of Heritage Assets (Historic England, 2017);
- Statements of Significance: Analysing Significance of Heritage Assets Historic England Advice Note 12 (Historic England, 2019); and
- Planning Practice Guidance (Ministry of Housing, Communities and Local Government 2014) (Historic Environment Guidance updated, 2019).

8.4 Study Area

8.4.1 To determine the historic environment potential within the Site and in line with standard industry practice, the following Study Areas have been applied:

- Within the Site Boundary – potential for physical impacts to heritage assets.
- A 1km radius Study Area around the Site – for effects arising from changes to the setting of assets, which may affect their heritage significance. This 1km Study Area was considered to be sufficient based on professional judgment due to the industrial nature of the Site and the topography of the area.

8.4.2 Professional judgement has been applied when scoping designated heritage assets potentially affected through changes to setting and, where relevant, assets beyond the Study Area may be considered. This is to ensure that any changes within the setting of affected designated heritage assets is taken into consideration.

8.5 Baseline Conditions

Data Sources

- 8.5.1 The following sources of information have been used to define the baseline conditions:
- Historic England: National Heritage List for England (NHLE), which provides information on statutorily designated heritage assets (Historic England, 2026);
 - CWCC: Historic Environment Record (HER), which is the primary repository of archaeological information, as well as holding information on Conservation Areas (CWCC, 2026);
 - British Geological Survey (BGS, 2026);
 - Groundsure: Ordnance Survey historic mapping (Groundsure, 2024);
 - Chester Archives: primary source of cartographic and local studies information for the county (Cheshire Archives, 2024); and
 - Other publicly accessible online sources.

Existing Baseline

Heritage Context of Site Location, Topography and Geology

- 8.5.2 The majority of the Site is located in the Stanlow Manufacturing Complex (SMC), approximately 4km to the southeast of Ellesmere Port. The River Mersey flows approximately 0.7km to the north of the Site (at its nearest point on the Red Line Boundary), with the region being prominent during the industrial revolution. The Manchester Ship Canal, which runs approximately 700m to the north of the Site (at its nearest point on the Red Line Boundary), and the River Mersey, allowed the

transportation of goods across the country and further afield during the post-medieval period.

- 8.5.3 The topography of the Site can inform on the potential for long reaching views and impacts on the setting of heritage assets in the vicinity of the Site. The Site lies relatively flat at an elevation of approximately 11m above Ordnance Datum (aOD) across the Site (Topographic Map, 2026). Flat topography can result in higher potential for uninterrupted views between the Site and heritage assets in the study area.
- 8.5.4 The geological background is predominantly Chester Formation Sandstone, with an area of Sandstone in the southwestern area of the Site. Till deposits overlie the whole of the Site, with a small area of alluvial deposits surrounding Gale Brook in the southeastern part of the Site (BGS, 2026). Holocene deposits with palaeoenvironmental are known to overlie the till deposits and may be preserved beneath layers of alluvium.

Designated Heritage Assets

- 8.5.5 An assessment of heritage assets that may potentially impacted by the Proposed Development has been undertaken in a detailed Heritage Statement (See **Volume 3, Appendix 8.1: Heritage Statement**). The Heritage Statement draws together available information on heritage assets in the study area to determine their significance, including contribution of setting. (See **Volume 2, Figure 8.1: Designated Heritage Assets**).
- 8.5.6 Designated heritage assets within a 1km Study Area have been identified through information collated from the NHLE and CWCC (See **Volume 2, Figure 8.1: Designated Heritage Assets**). There are no designated heritage assets within the Site Red Line Boundary.
- 8.5.7 There are two Scheduled Monuments located within the 1km Study Area, as follows:
- Ince Manor Monastic Grange and Fishpond (**NHLE: 1009635**), located approximately 500m north of the Site, within Ince Conservation Area; and
 - Moated Site, fishpond and connecting channel, Elton (**NHLE: 1012122**), located approximately 500m south east of the Site.
- 8.5.8 There is no intervisibility between either of these assets and the Site, and as such their settings would not be impacted by the Proposed Development.
- 8.5.9 The Grade II listed 'Building 50 at Thornton Aero Engine Research Laboratory' (NHLE: 1392326), is located approximately 25m from the Site boundary and forms part of the wider SMC. The building was constructed in 1940-1 as an aviation fuel research laboratory and offices. As a modern building located within the SMC

complex, the Proposed Development is unlikely to result in any adverse changes to the setting of this listed building.

8.5.10 The Thornton-le-Moors Conservation Area is located approximately 30m to the south of the Site. The Conservation Area contains nine listed buildings, as follows:

- Grade I listed 14th century 'Church of St Mary' (**NHLE: 1330242**);
- Grade II listed early 18th century 'Table Tomb to John Davies of Dunham, Southeast of Church of St Mary' (**NHLE: 1145887**);
- Grade II listed late 18th century to mid-19th century 'Retaining Wall bounding Churchyard of St Mary's Church on West, South Half on East side including Gate Piers at Southwest Corner' (**NHLE: 1130655**);
- Grade II listed early 18th century 'Glebe Farmhouse' (**NHLE: 1130652**);
- Grade II listed late 18th to early 19th century 'Church Farmhouse including Cottage Wing to West' (**NHLE: 1330241**);
- Grade II listed 17th century 'Thornton Hall' (**NHLE: 1130653**);
- Grade II listed late 17th or early 18th century 'Barn to Northeast of Thornton Hall' (**NHLE: 1130654**);
- Grade II listed 'Church House Farmhouse' late 18th century including Shippon abutting on north (**NHLE: 1330240**); and
- Grade II listed early 18th century 'Yew Tree House' (**NHLE: 1130651**).

8.5.11 The 'Church of St Mary' (**NHLE: 1330242**), which has 14th century origins, would have been the focal point of the settlement during the late medieval period. Its importance is highlighted in its designation as a Grade I listed building. The churchyard retaining wall (**NHLE: 1130655**) and table tomb southeast of the church (**NHLE: 1145887**) are additionally Grade II listed. The church's spire has some visual prominence within the settlement, but this is overshadowed by the chimney towers of the SMC plant to the north, which are evident in backdrop views of the church. Prior to the development of the Site and the wider industrial complex in the early 20th century, the land would have comprised agricultural fields, which contributed to the semi-rural setting of the village of Thornton-le-Moors.

8.5.12 The Church Farmhouse (**NHLE: 1330241**) is situated on the northern boundary of the Thornton-le-Moors. Constructed during the post-medieval period it would have been a domestic property for a wealthy occupant. The SMC is currently a significant part of the setting of the heritage asset, with chimneys from the SMC being prominent in views from the Church Farmhouse.

8.5.13 The listed buildings within the Thornton-le-Moors Conservation Area are designated due to their importance in the early development of the village. The

agricultural landscape to the east, south and west of the village contributes to its setting. The industrial nature of the Site and the SMC wider industrial complex is prominent in backdrop views of the listed buildings and the Thornton-le-Moors Conservation Area. Therefore, the SMC has an existing negative effect on the setting of the heritage assets noted, and there will be no impacts on other Grade II listed buildings within Thornton-le-Moors Conservation Area.

8.5.14

The Ince Conservation Area is located adjacent to the north of the Site at its southern extent. The Conservation Area contains one Scheduled Monument previously discussed (**Paragraph 8.5.7**) and twenty-three listed buildings, as follows;

- Grade II listed 'Lower Green Farmhouse with wall to front garden' (**NHLE: 1086967**);
- Grade II listed 'Park Cottages' (**NHLE: 1130341**);
- Grade II listed 'Wood Farm Farmhouse' (**NHLE: 1130342**);
- Grade II listed 'Barn at Wood Farm 100m south of farmhouse' (**NHLE: 1130343**);
- Grade II listed 'Portion of boundary wall between the Square and entrance to the Manor House' (**NHLE: 1130346**);
- Grade I listed 'Manor House of Abbey of St Werburgh Chester, including Old Hall and Monastery Cottages' (**NHLE 1138810**);
- Grade II listed 'Farm buildings abutting manor houses to southeast' (**NHLE:1138811**);
- Grade II listed 'Churchyard wall at St James' Church' (**NHLE: 1138813**);
- Grade II listed 'Lamp post in churchyard by north gate' (**NHLE: 1138814**);
- Grade II* listed 'Church of St James' (**NHLE: 1138815**);
- Grade II listed 'Coronation lamp post and lantern' (**NHLE: 1138818**);
- Grade II listed 'Outbuilding attached to south end of Village Green Farm facing the square' (**NHLE: 1138819**);
- Grade II listed 'Shippon at Lower Green Farm on east side of farmyard' (**NHLE: 1138820**);
- Grade II listed 'K6 telephone kiosk' (**NHLE: 1138824**);
- Grade II listed 'Proffit's lodge' (**NHLE: 1145881**);
- Grade II listed 'T-shaped shippon at Hall Farm 30m south of farmhouse' (**NHLE: 1318873**);

- Grade II listed 'Portion of boundary wall between junction of Kinsey's Lane with Pool Lane and Park Cottages' (**NHLE: 1318905**);
- Grade II listed 'Shippon on Wood Farm 30m south of farmhouse' (**NHLE: 1318909**);
- Grade II listed 'Stocks adjacent to Ince Manor House' (**NHLE: 1329994**);
- Grade II listed 'Yew Tree Farmhouse and attached shippon' (**NHLE: 1330393**);
- Grade II listed 'L-shaped shippon at Hall Farm 50m southwest of farmhouse' (**NHLE: 1330394**);
- Grade II listed '1, 2 and 3 with attached front garden walls' (**NHLE: 1335894**); and
- Grade II listed '7, 8 and 9, the square' (**NHLE: 1335917**).

- 8.5.15 The 'Manor House of Abbey of St Werburgh Chester, including Old Hall and Monastery Cottages' (**NHLE: 1138810**) is located approximately 500m from the Site along Marsh Lane within the Ince Conservation Area. Its importance is recognised, given its designation as a Grade I listed building. The Manor House forms the historic core of Ince, which developed around the Manor. There is no intervisibility between the Manor House and the Proposed Development due to intervening buildings and as such there would be no impact on the setting of this asset.
- 8.5.16 The 'Church of St James' (**NHLE: 1138815**) is located approximately 320m to the north of the Site. The Church has its origins in the 14th century and would have been a focal point of the settlement during the late medieval period. There is no intervisibility between the Church and the Site due to intervening woodland, and as such there would be no impact on this asset as the Site does not form part of its setting. All other Grade II listed buildings within Ince would be screened from the development by either intervening buildings or vegetation, and as such would not be impacted.
- 8.5.17 The Elton Conservation Area is located approximately 700m to the east of the Site. The Conservation Area contains six listed buildings as follows:
- Grade II listed 17th century 'Barn, now workshops' (**NHLE: 1115394**);
 - Grade II listed 17th century 'Cross Cottage' (**NHLE: 1115418**);
 - Grade II* listed 17th century 'Rock Farmhouse' (**NHLE: 1138369**);
 - Grade II listed early 18th century 'Laurels Farmhouse' (**NHLE: 1330218**);
 - Grade II listed 20th century K6 Telephone Kiosk (**NHLE: 1320225**); and

- Grade II listed late 18th century ‘Farm buildings at Laurel Farm’ (**NHLE: 1320457**).

8.5.18 Rock Farmhouse (**NHLE:1138369**) is located approximately 770m to the east of the Site. The farmhouse dates from the mid-17th century, dated internally via an inscription that reads ‘1626 T[homas] H[atton]’. There is no intervisibility between this asset and the Site due to intervening buildings within Elton, and as such the site does not form part of the setting of this asset. No other listed buildings within Elton Conservation Area would have intervisibility with the site, and would therefore not be impacted by the proposals.

Non-designated Heritage Assets

- 8.5.19 Known non-designated heritage assets have also been identified within the 1km Study Area from the CWCC HER. At the Thornton Aero Engine Research Laboratory, within the SMC and approximately 100m from the Site, there are two locally listed buildings, known as the Thornton BPM (Laboratory Buildings No. 27) (**HER number: DCH9541**) and Thornton Aero Engine Research Laboratory, Building 38 (**HER number: DCH9505**).
- 8.5.20 Prior to the development of the SMC in the early 20th century the Site lay within an agricultural landscape. The Ordnance Survey 6” mile mapping from 1872-1912 (not reproduced) shows that the Site lay outside of the centres of settlement with limited building development in the surrounding area.
- 8.5.21 There has been no evidence specifically identified at Ellesmere Port relating to the prehistoric periods, although Neolithic finds and Bronze Age settlement and funerary activities have been identified in the Mersey and Wirral areas of Cheshire, and Iron Age forts have been identified along the mid-Cheshire Ridge. Roman settlement has been identified throughout Cheshire, with focal points at the Roman fort at Chester, and at production areas to the east of Middlewich, Nantwich and around the Warrington area.
- 8.5.22 Although early medieval period activities are still hard to identify through the archaeological record in the region, medieval Cheshire flourished with a number of rural settlements being established in the period (Cheshire Archives, 2024). The Domesday Book entries from 1086 record a settlement of five households at Thornton-le-Moors, nine households at Elton, as well as six households at Stanney and [Little] Stanney, approximately 1.5km to the south west of the Site (at its nearest point on the Red Line Boundary).
- 8.5.23 The Ince Manor Monastic Grange, located within Ince, is one of the earliest recorded properties of St Werburgh’s Abbey, Chester. The Domesday Book records the Manor as possessing three hides, with arable land for five ploughs and about 1.8ha of meadow. The monastic grange continued in use through the

medieval period and into the post-medieval period. The available evidence indicates small scale settlement in the landscape surrounding the Site during the medieval period.

- 8.5.24 Archaeological evidence in Ellesmere Port is largely linked to the post-medieval period, with the development of industrial complexes along the River Mersey that were constructed alongside the development of the Manchester Ship Canal. This enabled the transportation of goods across the country and further afield during the late 19th and early 20th centuries (Cheshire Archives, 2024).
- 8.5.25 There is one record of post-medieval date that lies within the Site. Thornton Mill (**HER number: MCH10563**) was a water powered flour mill dating to the late 18th century. The mill was potentially located on the site of an earlier 'Ince Mill' mentioned since the 13th century. The mill buildings were demolished in 1896 and the site has now been incorporated into the SMC. No remains are expected to survive as they would have been destroyed during the construction of the SMC.
- 8.5.26 A Second World War heavy anti-aircraft battery is recorded to the east of the Site (**HER number: MCH9886**). The site was first documented in 1940 and continued in use through the Cold War period and now appears to be demolished. Also of Second World War date are a searchlight battery at Thornton-le-Moors (**HER number: MCH9868**) and an ammunition storage area (**HER number: MCH9985**).
- 8.5.27 The construction of the SMC from the 1920s, in line with modern industrial development at Ellesmere Port, and its associated infrastructure, including (but not exclusively) roads, factory buildings, chimneys and utilities, is likely to have entailed substantial below ground impact. These would likely have substantially truncated or removed any potential archaeological remains within the Site. As such, all of the Site archaeological survival will be nil as the construction of the SMC will have likely removed any archaeological remains present.

Future Baseline

- 8.5.28 The future baseline is not expected to change from the existing baseline described above. This is because buried heritage assets are a static resource, which have reached equilibrium with their environment and do not change (i.e. decay or grow) unless their environment changes as a result of human or natural intervention.
- 8.5.29 For the setting of heritage assets within the Study Area, their significance may change if future development takes place, which could have a detrimental or positive effect on the setting of heritage assets and could result in the intervening presence of buildings and/or vegetation.
- 8.5.30 Increased rainfall, sea levels and storm events, leading to fluvial erosion poses a risk to archaeology. Drier summers could cause droughts and ground shrinkage. Greater extremes and fluctuations of temperature will increase thermal expansion

and contraction of materials such as wood, stone, metal and paint. This is not anticipated to be significant for archaeological remains.

- 8.5.31 In drier conditions, the risk of soil erosion increases, as well as soil shrinkage, which can cause subsidence, structural deformation and collapse. There are no buildings of historic significance recorded on the Site that would potentially be impacted by shrinkage.

Sensitive Receptors

- 8.5.32 Sensitive receptors have been identified based on their significance and how the setting contributes to that significance, and their proximity to the Site, which is considered to form part of their setting. The selection of sensitive receptors has been informed by the assessment completed with the Heritage Statement (See **Volume 3, Appendix 8.1: Heritage Statement**), and justification is provided within this document. The selection of sensitive receptors has also been informed by consultation undertaken for CHP Phase 1. The sensitive receptors identified in **Section 8.7** are as follows:
- Thornton-le-Moors Conservation Area;
 - Grade I listed 'Church of St Mary' (**NHLE: 1330242**), which is designated as Grade I Listed Building within the Conservation Area (and is therefore highly significant);
 - Grade II listed Retaining wall bounding churchyard of St Mary's Church on west, south and half of east side including gate piers at southwest corner (**NHLE: 1130655**; included for group value with the Church of St Mary);
 - Grade II listed Table tomb to John Davies of Dunham, southeast of Church of St Mary' (**NHLE: 1145887**; included for group value with the Church of St Mary);
 - Grade II listed 'Church Farmhouse' (**NHLE: 1330241**); and
 - Ince Conservation Area.

8.6 Description of Likely Significant Effects

Construction Phase

Designated Heritage Assets

- 8.6.1 Increased construction traffic and machinery will be present on the SMC during the construction phase of the Proposed Development. High mast towers will be used for lighting during the construction phase of the Proposed Development.

Temporary construction compounds will also be located on existing hardstanding areas within the Site.

- 8.6.2 The settings of the sensitive receptors either do not extend within the Site or would only experience a negligible change. This is because the construction phase of the Proposed Development is consistent with the industrial character of the Study Area. As such, no significant effects are predicted on heritage assets due to change within their setting during the construction phase.

Below Ground Non-designated Heritage Assets (Archaeological Remains)

- 8.6.3 The majority of the Site lies within the boundary of the existing SMC, with only a small area extending outside this boundary in the northeast of the Site. The evolving design indicates that each new Heat Recovery Steam Generators (HRSG) will have excavation depths that will be approximately 3m below the finished ground level (FGL). It is understood that underneath each of the footings for the HRSGs, there will be Plain Cement Concrete, which the footings will be constructed on top of. Vertical excavations will be approximately 0.5m deep from FGL for purposes of fencing through the Site. There may also be vertical excavation depths of 1m from FGL for specific components of the HRSGs. There will be some underground utilities cabling installed through the Site.
- 8.6.4 It is assumed that in the areas of construction for the HRSGs there will be widespread stripping of overburden prior to the excavations for the footing. The proposed method of construction (e.g. piling) has not been confirmed at this stage in the design.
- 8.6.5 Archaeological below ground remains are not anticipated to survive within the Site due to truncation from previous development of the SMC. The proposed construction compound and material storage areas will be placed on top of existing hardstanding areas.
- 8.6.6 The majority of construction traffic access will be taken via the main entrance to the SMC on Pool Lane. A second access to the Site, located on the A5117, will be used for abnormal loads. This access is located approximately 100m east from the A5117/Thornton Green Lane priority junction. Vegetation clearance will be required in this area though it is understood that deeper excavation or subsoil strip will not be required (**Chapter 2: The Proposed Development**).
- 8.6.7 The palaeoenvironmental technical note undertaken for the Proposed Development has shown that at the location of the proposed GTs and HRSGs peat and alluvium deposits were recorded at depths of between 3.9m and 5.0m below ground level (BGL). Foundations will be to a depth of approximately 3m.

Therefore, there is no anticipated impact on the recorded depths of peat and alluvium within the site.

Operational Phase

Designated Heritage Assets

Thornton-le-Moors Conservation Area

8.6.8 Thornton-le-Moors Conservation Area was designated in October 1981 (extended October 1996) and is centred around the Church of St Mary, which has 14th century elements, including its tower. The latter has some landmark qualities within the village. Other notable buildings within the designation include Thornton Hall, which is a 17th century farmhouse, and Glebe Farmhouse dating from the 18th century. The historic interest of the designation lies in its relationship to agricultural industries, with two working farms recorded in the local HER as still in use by 2000 (see **Volume 3, Appendix 8.1: Heritage Statement**). The low scale nature of the village is in stark contrast to the industrial SMC adjacent to its northern boundary. The industrial chimneys are prominent fixtures visually in backdrop views of the designation, with historic photos indicating that there was less woodland screening from the SMC in the 1970s than in the present day. Thornton-le-Moors has been recorded since the Domesday Survey, and the Manor changed hands a number of times during the medieval and post-medieval periods. The HRSG stack heights remain to be confirmed, but it is likely that the HRSGs will be visible in backdrop views to the of the Thornton-le-Moors Conservation Area (CA) designation.

Church of St Mary (NHLE: 1330242) Retaining wall bounding churchyard of St Mary's Church on west, south and half of east side including gate piers at southwest corner (NHLE: 1130655), and table tomb to John Davies of Dunham, southeast of Church of St Mary (NHLE: 1145887)

8.6.9 The Grade I listed Church of St Mary would have been the focal point of the late medieval settlement. Its earlier elements, such as its tower, were constructed in the 14th century, likely on the site of a pre-conquest church. The parish church served Thornton-le-Moors, Elton, Dunham Hill, Hapsford and Wimbold's Trafford until the 19th century. Its significance lies in its historic and architectural interest, being a mixture of Gothic, Tudor and later architectural styles, as it has a number of features that span from its first construction to the modern period (see **Volume 3, Appendix 8.1: Heritage Statement**). The retaining wall encloses the churchyard, and the table tomb sits within the churchyard itself. It is anticipated that the HRSGs will be visible in views of the Church looking north.

Church Farmhouse including Cottage wing to west (NHLE: 1330241)

- 8.6.10 The Grade II Church Farmhouse is situated on the northern boundary of the Thornton-Le-Moors CA, which would have been a domestic property for a wealthy occupant constructed during the later post-medieval period. Its principal elevation faces south, looking inwardly into the CA, in a L-shaped plan. Furthermore, the primary significance of the asset lies in its rural and agricultural use during the post-medieval period, and this setting is still evident to the south and southeast of the asset (see **Volume 3, Appendix 8.1: Heritage Statement**). It is anticipated that the HRSGs will be visible in views of the Farmhouse looking north.

Ince Conservation Area

- 8.6.11 The Ince Conservation Area was designated in 1969 (extended in 2004 and 2023), with its importance associated with its rural village atmosphere and character. The designation is largely screened from the SMC to the west, given the tree cover in the former parkland of Ince Hall. The parkland forms the western part of the designation, with the key buildings to the east. The designation retains its medieval street pattern, with an informal layout of buildings through the village with a formal square at its centre. During the post-medieval period, agricultural and maritime industries were important factors in the village's development, and it largely grew to the north and east of the Grade II* listed Church of St James. The significance of the designation lies in its historic interest that is largely tied to Ince Manor, which was recorded in the Domesday Book and still retains elements of the original medieval stonework.
- 8.6.12 The church and other listed buildings within the village also contribute to its historic and architectural interest. In the north part of the Site, close to the Conservation Area, the only proposals are for pipe racks starting 5m above ground level and these will be screened from view from the majority of the Conservation Area by intervening woodland. HRSG stacks are located at the south part of the Site, approximately 1.2km from the Ince Conservation Area, the heights of which will be confirmed during the next design stage. There may be distant views towards these new structures from certain locations within the Conservation Area, particularly along Kinsey's Lane on the northern edge of the Conservation Area. Due to screening between the Site and the Conservation Area, views towards the location of the HSRG stacks will be screened from most locations within the Conservation Area, but there may be some distant views from specific locations (See **Volume 3, Appendix 8.1: Heritage Statement**).

Summary

- 8.6.13 The Proposed Development would largely be consistent with the setting of the heritage assets noted above. There are likely views of the HRSGs from the Thornton-le-Moors Conservation Area, Church of St Mary (and associated

retaining wall and table tomb), and Church Farmhouse. HRSGs may be visible from the Ince Conservation Area but due to the distance they are unlikely to result in significant impacts on the setting of this asset.

- 8.6.14 The Proposed Development may result in changes to the setting of designated assets for which the Site forms part of their setting. Impacts are expected on the sensitive receptors identified in **paragraph 8.5.32** based on their sensitivity and proximity to the Site. There will be no impacts on the significance of any other designated assets in the Study Area, either because the Site does not form part of their setting, or the Proposed Development would not result in any changes to the significance of that asset.

Below Ground non-designated Heritage Assets (Archaeological Remains)

- 8.6.15 Archaeological below ground remains are only considered within the construction phase due to the nature of the assets (being below ground).

Scope

- 8.6.16 A summary of the proposed scope for the cultural heritage construction and operational phase assessments is presented in **Table 8.2**.

Table 8.2 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Buried heritage assets within the Site.	Construction, Operational and Decommissioning		✓	It is anticipated that any buried assets within the Site will have already been significantly truncated/entirely removed by previous development at the SMC. Therefore, effects on potential buried archaeology can be scoped out.
Designated built heritage assets outside of the Site.	Construction, Operational and Decommissioning	✓		It is proposed that impacts on the Grade II listed 'Building 50 at Thornton Aero Engine Research Laboratory' be scoped out as the setting of the listed building is already industrial in nature as part of the SMC and the Proposed Development would not result

Element	Phase	Scoped In	Scoped Out	Justification
				in any changes to the setting of this asset. For those assets outside the SMC whose setting includes the Site (Thornton-le-Moors Conservation Area, Church of St Mary, retaining wall and Church of St Mary, table tomb southeast of Church of St Mary, Church Farmhouse, Ince Conservation Area) impacts are scoped in as there may be changes to the setting of these designated assets as a result of new structures within the Site, which may adversely impact on their significance. For other assets within the Study Area there is not considered to be a change to their setting due to the nature of their setting (as described in Section 8.5). Therefore, effects on these designated built heritage assets within the Study Area can be scoped out.

8.7 Mitigation Measures

8.7.1 There are no embedded mitigation measures.

8.7.2 Any requirements for additional mitigation and/or protection measures of sensitive receptors, as listed in **Section 8.5**, will be included in an Outline Code of Construction Practice (CoCP). The Outline CoCP will provide appropriate additional mitigation strategies with the aim to reduce or offset any significant adverse effects identified. Additional mitigation measures may include:

- physical protection measures and transit plans for vehicles or materials coming to and from site via road or water to avoid or reduce the risk of strikes to listed structures; and
- hoardings or fencing to reduce or remove temporary visual change within the setting of assets during construction.

- 8.7.3 Furthermore, an accompanying HS (see **Volume 3, Appendix 8.1: Heritage Statement**) has been prepared as an additional mitigation and enhancement measure for the Proposed Development.
- 8.7.4 There is no requirement for further design, mitigation and enhancement measures for non-designated assets or below ground archaeology beyond those that will be included in the Outline CoCP as there is not considered to be the potential for significant effects.

8.8 Assessment Methodology

- 8.8.1 The ES Chapter will set out the planning framework in respect of built heritage assets. It will include the methodology for assessing the environmental effects predicted during the construction, operational and decommissioning phases. It will provide a summary overview of the baseline conditions.
- 8.8.2 The cultural heritage assessment will be supported by a technical appendix in the form of a Heritage Statement. The Heritage Statement will include a detailed baseline compiled through a range of data sources, namely;
- Historic England NHLE for details of designated heritage assets;
 - CWCC HER – for details of non-designated heritage assets, past heritage investigations, conservation areas and locally listed buildings;
 - British Geological Survey (BGS) – details on underlying geology;
 - Analysis of historic mapping; and
 - Review of readily available regional and local contextual studies.
- 8.8.3 A walkover survey has been undertaken to assess potential impacts on the setting of designated built heritage assets within the 1km study area around the Site. Setting has only been assessed where assets were accessible from public areas. Due to the nature of the Site further investigative work, such as geophysical survey or trial trenching, is not proposed.

Significance Criteria

Value Criteria

- 8.8.4 The NPPF defines significance as *“The value of a heritage asset to this and future generations because of its heritage interest. That interest may be historic, archaeological, architectural or artistic.”*. The determination of the significance is based on statutory designation and/or professional judgement against these values (they are also identified in Historic England Statements of Heritage Significance).

- 8.8.5 Each asset is evaluated against the range of NPPF criteria listed above on a case-by-case basis.
- 8.8.6 In relation to known heritage assets, where feasible and warranted, the assessment considers the contribution that the historic character and setting make to the overall significance of the asset.
- 8.8.7 **Table 8.3** gives examples of value criteria of designated and non-designated heritage assets.

Table 8.3 Value of Heritage Assets

Heritage Asset Description	Value
World Heritage Sites	Very High
Scheduled Monuments. Grade I Listed Buildings. Grade II* Listed Buildings. Grade II Listed Buildings that can be shown to have exceptional qualities in their fabric or historical associations, or that are clearly associated with heritage assets of high, national significance. Conservation Areas containing buildings of great importance. Undesignated structures of clear national importance. Undesignated below ground heritage assets of clear national importance.	High
Grade II Listed Buildings that can be shown to have qualities in their fabric or historical association of regional importance only. Conservation Areas containing buildings that contribute significantly to its historic character. Historic Townscape or built up areas with important historic integrity in their buildings or built settings. Known buried heritage assets of regional importance.	Medium
Locally Listed Buildings. Historic (unlisted) buildings of modest quality in their fabric or historical association. Historic Townscape or built up areas of limited historic integrity in their buildings or built settings. Known buried heritage assets of local importance.	Low
Buildings of no architectural or historical note; buildings of intrusive character.	Negligible
Buildings with some hidden (i.e. inaccessible) potential for historical significance.	Uncertain

Heritage Asset Description	Value
Unknown buried heritage assets.	

Magnitude of Change

8.8.8 Determination of magnitude of change upon the significance of built heritage assets is based on the severity of the likely impact (e.g. physical effects on built heritage assets or the permanent presence of new structures, that result in changes to the contribution of setting to the heritage significance of a built heritage asset). **Table 8.4** describes the criteria used in this assessment to determine the magnitude of change.

Table 8.4 Magnitude of Change

Impact	Description
Major	Change to most or all key archaeological materials or key historic building elements, such that the resource is totally altered. Comprehensive changes to setting.
Moderate	Changes to many key archaeological materials or key historic building elements, such that the resource is clearly modified. Considerable changes to setting that affect the character of the asset.
Minor	Changes to key archaeological materials or key historic building elements, such that the asset is slightly altered. Slight changes to setting.
Negligible	Very minor changes to archaeological materials or historic building elements or setting.
No Change	No change.

Significance Levels

8.8.9 The significance of effect on heritage assets has been derived from a consideration of the significance (value) of the receptor (asset) and the magnitude of the impact upon it, as illustrated by the matrix in **Table 8.5**.

8.8.10 The significance of environmental effect is outlined in **Table 8.5**. Effects may be either negative (adverse) or positive (beneficial) and are defined initially without additional mitigation but including embedded mitigation. The table is a guide only, so that the process is transparent and the rationale for the effect scores is provided in the relevant sections. Where the resulting effect comprises two separate levels (i.e. 'Moderate or Slight' or 'Neutral or Slight'), professional judgement has been applied to select the most appropriate significance of effect.

- 8.8.11 The significance of effect as a result of changes to assets of 'uncertain' value will always be unknown.

Table 8.5 Significance of Environmental Effect

		Magnitude of impact (degree of change)			
		High	Medium	Low	Very low
Environmental value (sensitivity)	High	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Negligible	Negligible
	Very low	Minor	Negligible	Negligible	Negligible

- 8.8.12 Within the NPPF, impacts affecting the value of heritage assets are considered in terms of harm and there is a requirement to determine whether the level of harm amounts to 'substantial harm' or 'less than substantial harm'. There is no direct correlation between the significance of effect that will be reported in the ES and the level of harm caused to heritage value. Rather than apply the test of the NPPF when considering the impact of the Proposed Development on designated assets, the language used in the NPPF (i.e. less than substantial harm or substantial harm) has been correlated with the standard EIA methodology. In EIA terms, a Moderate or greater effect is considered 'Significant'. A Major effect equates to 'substantial harm' whilst all the lesser effects are considered 'less than substantial harm'

8.9 Assumptions and Limitations

- 8.9.1 No limitations and assumptions have been identified at this stage.

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PUBLIC

EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 9: Landscape and Visual

02-09-2026

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VOLUME 3 APPENDICES

Appendix 9.1 Visual Impact Assessment Methodology

9. Landscape and Visual

9.1 Introduction

- 9.1.1 This chapter considers the potential impacts of the Proposed Development on landscape character and visual amenity during the construction and operational phases. It sets out the proposed methodology for the landscape and visual assessment and identifies impacts that can be scoped out of the Environmental Impact Assessment (EIA).

9.2 Consultation and Engagement

- 9.2.1 There has been no specific consultation carried out in relation to the Landscape and Visual Scoping chapter for the Proposed Development, at the time of writing. Engagement undertaken for the Town and Country Planning Act (TCPA) Combined Heat and Power (CHP) Phase 1 development is summarised in **Table 9.1**. The engagement undertaken on CHP Phase 1 to date is relevant to the Scoping of the Proposed Development, as it has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches which, due to their shared location within the Stanlow Manufacturing Complex (SMC), are applicable to the Proposed Development.
- 9.2.2 Feedback in relation to this topic and the scope of works gained as part of the Proposed Development EIA Scoping Opinion will inform the production of the Environmental Statement (ES).

Table 9.1 Consultation and engagement to date

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
Cheshire West and Chester Council (CWCC)	October 2024	It was requested that the viewpoints provided are supported by photomontages.

- 9.2.3 An introductory briefing meeting on the Proposed Development was undertaken with Natural England in April 2026. Further workshops, as appropriate, will be undertaken by the Applicant to inform the scope of the ES.

9.3 Guidance

9.3.1 This chapter has, and when undertaken the assessment will, give consideration to the following guidance:

- Guidelines for Landscape and Visual Impact Assessment. Third Edition (GLVIA 3) (Landscape Institute and the Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management and Assessment (IEMA) (ISEP, 2013);
- An Approach to Landscape Character Assessment (LCA) (Natural England, 2013); and
- Landscape Institute Technical Guidance Note (TGN) 06/19 (2019); 'Visual Representation of Development Proposals' (Landscape Institute, 2019).

9.4 Study Area

9.4.1 The GLVIA 3 clarifies how study areas should be determined on a project-specific basis. Paragraph 5.2 of GLVIA 3 states that the Study Area extent should be:

"... based on the extent of Landscape Character Areas likely to be significantly affected either directly or indirectly" or "on the extent of the area from which the development is potentially visible, defined as the Zone of Theoretical Visibility, or a combination of the two" (Landscape Institute and ISEP, 2013).

9.4.2 The Study Area is based on professional judgement, which includes an initial analysis of the anticipated scale and likely geographical influence of the Proposed Development. Following a desktop review of the Site, a Zone of Theoretical Visibility (ZTV) Plan has been prepared based on an approximate heights of 80m (representing the Heat Recovery Steam Generator (HRSG) Stack) and 22.5m (representing the HRSG). Using the Rochdale Envelope approach the assessment will be based upon the maximum dimensions (e.g. widest buildings, maximum proposed height) for the buildings and structures of the Proposed Development using a parameters based approach.

9.4.3 **Volume 2, Figure 9.5: ZTV and Viewpoint Location Plan** demonstrates that visibility towards the Proposed Development will be principally from the wider landscape to the east, southeast and southwest towards Stoak and the M56.

9.4.4 At close proximity, where impacts would be most experienced, the ZTV demonstrates visibility broadly to the south of the Proposed Development and for a limited section to the north beyond the SMC toward the low-lying landscape associated with the River Mersey. Within the wider context however, views are principally identified to the south and south-west towards the village of Stoak.

While the ZTV demonstrates that views towards the Proposed Development are likely to appear available within longer distance views from residents at, and to the north of, Picton, the M56 road corridor will lie between these receptors and the Site introducing a further detracting feature within the landscape. Where visible, the elements of the Proposed Development are likely to only be seen as glimpsed and filtered views of taller elements, viewed within the immediate context of the SMC, with views similar to those represented by Viewpoint 5 (see **Volume 2, Figure 9.6: Viewpoint Photography**). Views from the wider landscape to the north will see the Proposed Development within the context of the existing industrial built features within the SMC, with the Proposed Development set beyond these features further to the south. New additions, whilst likely to appear visible will therefore be filtered by industrial context.

- 9.4.5 A site visit (17-07-2024) was conducted to understand the baseline to further support the desktop study. During the visit, it was apparent through professional judgement that despite some longer distance visibility, the potential for significant effects beyond 2km is limited, with the furthest receptor (residents at Stoak and recreational users of Shropshire Union Canal) located at approximately 1.8km to the southwest. A Study Area of 2km offset from the Proposed Development has therefore been identified as appropriate to capture significant landscape and visual effects during the construction and operational phases.
- 9.4.6 The Site Boundary and Study Area are shown within **Volume 2, Figure 9.5: ZTV and Viewpoint Location Plan**.

9.5 Baseline Conditions

Existing Baseline

- 9.5.1 The baseline landscape and visual conditions for the Proposed Development are considered with respect to the Study Area identified above.
- 9.5.2 Sources of information used to define the baseline include:
- Natural England (NE) National Landscape Character Areas (Natural England, 2013-2014);
 - Multi-Agency Geographic Information for the Countryside Maps (MAGIC) (Defra, 2026);
 - Cheshire West and Chester Landscape Strategy 2016 (Cheshire West and Chester Council, 2016);
 - Ordnance Survey (OS) 1:25k and 1:50k mapping; and
 - Google Earth Pro.

Landscape Character

- 9.5.3 The Proposed Development is situated within the existing industrial area at the SMC as identified on **Volume 2, Figure 1.1: Site Location Plan**. The Proposed Development is predominantly located within an urban area, with the eastern extent of the Site falling partially within LCA 9A. The Proposed Development and Study Area extend across two National Character Areas (NCA) and approximately four local character areas.

Landscape Character Areas

- 9.5.4 The SMC lies across two NCAs, NCA 60 – Mersey Valley and NCA 61 – Shropshire, Cheshire and Shropshire Plain. At a more local level, the Site lies within the Cheshire West and Chester Council (CWCC) Local Landscape Type (LCT) allocated to Urban Areas as well as LCT 9 Cheshire Plain West, LCT 4 Drained Marshes, LCT 15 River Valley and LCT 16 Mudflats and Saltmarsh. These, along with the LCAs, are shown on **Volume 2, Figure 9.2: Landscape Character and Designations Plan Sheet 1** and **Figure 9.3: Landscape Character and Designations Plan Sheet 2**.
- 9.5.5 **Table 9.2** and **Table 9.3** set out a brief description of the key characteristics associated with those character areas that lie within the Study Area.

Table 9.2 National Character Areas

NCA	Key Characteristics
Mersey Valley (60)	■ The landscape is low-lying, focusing on the broad linear valley of the River Mersey; it is estuarine in the west and has extensive areas of reclaimed mossland in the east. ■ The Mersey Estuary is a defining element in the landscape, with expansive intertidal mudflats/sand flats and low exposed cliffs. ■ The River Mersey flows from east to west, joined by associated tributaries, although the Mersey itself is often obscured from view. ■ Trees and woodland are mainly associated with settlements, occasional parkland and isolated woodland blocks; and in recent years new community woodlands have been planted. ■ Large scale, open, predominantly flat, high-quality farmland occurs between developments, with primarily arable farming to the north of the valley and a mixture of arable and dairy farming to the south. ■ The field pattern is regular and large scale, often defined by hedgerows with isolated hedgerow trees. Many hedgerows are intermittent and have been replaced by post-and-wire fencing, while field boundaries on the mosses are marked by ditches.

NCA	Key Characteristics
	■ There are densely populated urban and suburban areas, with major towns particularly at the river crossings, including Runcorn, Widnes and Warrington. ■ There is large scale, highly visible industrial development, with docks, chemical works and oil refineries. ■ The river valley has a dense communication network with motorways, roads, railways and canals running east–west, and power lines are also prominent.
Shropshire, Cheshire and Staffordshire Plain (61)	■ Prominent discontinuous sandstone ridges of Triassic age, characterised by steep sides and freely draining, generally infertile soil that supports broadleaved and mixed woodland. ■ Few woodlands, confined to the area around Northwich and to estates. Cloughs and deciduous and mixed woods on the steeper slopes of the wind-swept sandstone ridges. Locally extensive tracts of coniferous woodland and locally distinctive orchards scattered throughout. ■ Strong field patterns with generally well-maintained boundaries, predominantly hedgerows, with dense, mature hedgerow trees. Sandstone walls occur on the ridges and estate walls and Cheshire-style (curved topped) metal railing fences occur locally on estates in Cheshire. ■ Dairy farming dominates on the plain, with patches of mixed farming and arable in the north and large areas in the southeast. ■ Diversity of wetland habitats includes internationally important meres and mosses comprising lowland raised bog, fen, wet woodland, reedbed and standing water, supporting populations of a host of rare wildlife, including some species of national and international importance. ■ Extensive peat flood plains where flood plain grazing marsh habitats support regionally important populations of breeding waders in areas such as Baggy Moor, Weald Moor and Doxey Marshes. ■ Many main rivers and their flood plains lie in this area, including the Dee, Dane, Severn, Penk and Sow. Significant areas of grazing marsh, alluvial flood meadows and hay meadows associated with the rivers Dee, Sow, Gowy and Severn. The area has the highest density of field ponds in western Europe. ■ Regularly spaced, large farmsteads, dispersed hamlets, market towns and many other settlements including Macclesfield and Telford. Timber-frame buildings are a distinctive feature of the plain, often highly decorated in Cheshire, for example, the moated Little Moreton Hall. ■ Parklands and gardens associated with estates such as Chillington, Trentham, Tatton and Attingham; country houses such as Gawsworth Hall, Arley Hall and Adlington Hall; and fortified manor

NCA	Key Characteristics
	houses and castles such as at Shrewsbury, Stafford, Beeston, Acton Burnell and Cholmondeley. The numerous canals are important for recreation as well as habitat. Several National Cycle Routes and nearly 5,000km of public rights of way cross the plain. Six National Nature Reserves (NNRs) are scattered throughout, close to large population centres and well used for recreation.

Table 9.3 Local Character Areas

LCA	Key Characteristics
LCA 9a: Dunham to Tarvin Plain	- A broad, gently shelving and mostly flat plain landscape characterised by hedges and hedgerow trees providing limited vistas. - Wide areas of improved grassland for dairy farming and fodder crops. - Limited woodland, confined to isolated coverts and copses, although hedgerow oaks are important elements of the landscape. - Historic medieval field patterns and increases in tree cover are still found around smaller settlements. - Extensive network of small field ponds which are generally inconspicuous in the landscape. - Larger settlements punctuate the plain where historic form has often been lost within areas of 20th century and later housing development, e.g. at Tarvin. - Elsewhere, settlement is scattered across the plain in small linear hamlets and freestanding farmsteads. - Petro-chemical and industrial development outside the character area is prominent across the north of the LCA. - The Sandstone Ridge presents a more elevated skyline to the east of the LCA. - Where hedgerows and tree networks remain, the area can present some degree of limited enclosure due to an absence of elevation and viewpoints. - Some loss of field boundaries diminishes this enclosure where some arable farming has been established. - Significant transport infrastructure dissects the area and diminishes tranquillity and rurality, particularly across the north of the LCA.
LCA 9d: Saughall to Waverton Plain	- Urban-fringe landscape with significant settlement density. - Prominent infrastructure characterises the urban fringe of Chester and routes radiating from it. - The urban and industrial character and infrastructure of Ellesmere Port to the north is a prominent landscape feature.

LCA	Key Characteristics
	■ Rural pastoral landscape is diluted by many urban fringe uses which introduce complexity and intrusion to the landscape. ■ Elsewhere, a gently undulating landscape characterised by hedges and hedgerow trees providing limited vistas. ■ Limited woodland, confined to shelter belts and screening planting, some small copses, although hedgerow oaks are important elements of the landscape. ■ Significant villages of a suburban character punctuate the plain. ■ Settlement is scattered across the plain as freestanding farmsteads and some ribbon development. ■ The Sandstone Ridge presents a more elevated skyline to the east of the LCA. ■ Where hedgerows and tree networks remain, the area can present some degree of limited enclosure due to an absence of elevation and viewpoints. ■ Some loss of field boundaries diminishes this enclosure where some arable farming has been established. ■ The overall character of the area is of a transitional landscape from rural pasture to suburbanised, busy urban fringe with consequent dilution in tranquillity.
LCA 15i: Gowy Valley	■ A transitional river corridor landscape where the small watercourse evolves from distinct valley profile to a weak visual feature within a wider Cheshire Plain West landscape. ■ In places across its northern extent the river becomes almost indiscernible in the landscape as it is managed, embanked and dispersed across a network of drains and cuts, particularly around Stamford Bridge and Plemstall. ■ Mixed low hedge and drainage ditch field boundaries, with evidence of boundary loss, resulting in generally large, poorly delineated field pattern. ■ Contains the Shropshire Union Canal. ■ Shallow but pronounced and rolling valley sides characterise the passage of the river through the Beeston Hills with the canal and railway slightly elevated on the valley sides above the river. ■ The northern reaches of the area are characterised by open, very low lying pasture and some arable land use, with embanked river channel and an extensive drainage ditch network. ■ Trees and woodland is sparse in the area, although more prevalent around small settlements and buildings and along limited stretches of the river as riparian habitat. ■ Public footpaths alongside the canal and riverside in places provide recreational opportunities.

LCA	Key Characteristics
	■ To the south of the area views are typically restricted to within the river valley, for example there are views across the valley from either side, and from the transport corridors on the valley sides. The top of the valley side generally forms a skyline between Tilston and Huxley. ■ To the northern reaches, open vistas in all directions become possible over open and sometimes bleak drained landscape. ■ To the northern elements of the area the M56 motorway and the SMC dominate views out of the area with few screening elements in the landscape to mitigate the visual impact. ■ Away from its northern parts, it is generally a quiet, tranquil landscape with a low settlement density. However, railway and canal infrastructure provides built features and movement as well as industrial heritage value. ■ Significant settlement is generally absent from the area, except at locks across the south and farmsteads to the northern reaches.
LCA 4a: Frodsham, Helsby & Lordship Marshes.	■ A flat, low lying landscape (up to 13m AOD) of former mudflats and saltmarsh alongside the Mersey Estuary, contrasting with surrounding built development (previously designated as an Area of Significant Local Environmental Value – ASLEV). ■ Strong interconnection and intervisibility with LCT 16 Mudflats and Saltmarsh to the north. ■ The flat landscape is etched with a distinctive pattern of straight drainage ditches which delineates the field pattern of planned 19th century enclosure. ■ Incomplete hedgerow boundaries provide partial enclosure along some field boundaries. ■ A system of surfaced tracks and bridleways serve the area, including National Cycle Route (NCR) 5.
LCA 16a: Stanlow and Ince Banks.	■ A flat, open and expansive landscape of mudflats, sandflats and saltmarsh alongside the Mersey Estuary. ■ Strong interconnection and intervisibility with LCT 4 Drained Marsh to the south. ■ A naturalistic landscape with winding channels forming intricate patterns in the salt marsh. ■ A remote and peaceful landscape relatively undisturbed by humans and of international importance for nature conservation. ■ No public access to this remote area, although there is a landing stage on the canal at Frodsham Score to the east of the area. ■ Devoid of settlement. ■ Long, uninterrupted views and large skies.

National and Local Designation

- 9.5.6 There are no national landscape designations located within the identified Study Area.
- 9.5.7 Further information with regard to heritage assets can be found within **Chapter 8: Cultural Heritage**. Conservation areas contribute to the value of the character area that they sit within. Within the Study Area, three conservation areas have been identified. These are listed in full below. Conservation area locations are provided on **Volume 2, Figure 9.1: Landscape Character and Designations Plan Sheet 1** and **Figure 9.2: Landscape Character and Designations Plan Sheet 2**.
- Thornton-le-Moors Conservation Area is located approximately 20m to the south of the Red Line Boundary;
 - Ince Conservation Area is located approximately 10m north of the Red Line Boundary; and
 - Elton Conservation Area is located approximately 700m to the east of the Red Line Boundary.

Visual Amenity

- 9.5.8 In terms of visual receptors (i.e. people with views), the Proposed Development is situated within the industrial area at the SMC and as such is physically contained within the heavily developed landscape, with tall industrial buildings and dense vegetation limiting visibility towards the Site. Public access into the SMC is not permitted and as such views towards the Site are from publicly accessible locations outside the Site and from nearby Public Rights of Way (PRoWs). National Cycle Network (NCN) Route 5 runs adjacent to the A5117, along the southern boundary of the Proposed Development to the south of SMC, lying within close proximity to the boundary of the industrial area. In addition, the settlement at Thornton-le-Moors lies just beyond this to the south and Elton to the east. The Canal Towpath Trail follows the Shropshire Union Canal 2km to the west of the SMC, and local footpaths cross the fields 300m to the south, linking Stoak in the west with Thornton-le-Moors to the south. Another footpath adjacent to the southeast boundary links the site to Elton Green and Elton to the east.
- 9.5.9 Following a desktop study, a review of the CHP Phase 1 TCPA ZTV and subsequent updates to the ZTV, it was initially identified that key views of the Proposed Development were shared with CHP Phase 1, therefore viewpoint photography undertaken on the 17 April 2024 to identify potential visual receptors and capture viewpoint photography has been used to inform the assessment of the Proposed Development.

- 9.5.10 Potential views have been presented within a series of viewpoints in **Volume 2, Figure 9.6: Viewpoint Photography** and **Volume 2, Figure 9.5: ZTV & Viewpoint Location Plan** shows the locations from which photo viewpoints have been taken to represent views from people in sensitive locations, such as houses and PRowWs. A list of these viewpoints is provided within **Table 9.4**.

Table 9.4 List of viewpoints and identified receptors

Viewpoint Ref	Viewpoint Location	Identified Receptors
VP1	Junction of Thorn Green Lane and A5117.	Cycle users of NCN Route 5. Visitors to Hayrack Church Farm Park and Café.
VP2	Poole Lane, Thornton-le Moors.	Residents at Thornton-le-Moors.
VP3	Public Footpath Thornton-le-Moors FP1 on the western edge of Thornton-le-Moors.	Recreational users of Public Footpath Thornton-le-Moors FP1
VP4	Public Footpath Elton FP1 on the western edge of Elton.	Recreational users of Public Footpath Elton FP1. Residents at Elton.
VP5	Public Footpath Stoke FP1 as it crosses the Shropshire Union Canal.	Recreational users of Public Footpath Stoke FP1. Recreational users of the Shropshire Union Canal.

Sensitive Receptors

- 9.5.11 The Site is predominantly within the area identified by CWCC as 'Urban Areas'. However, the Site also falls partially within the western extent of LCA 9A. There is not expected to be any notable effect on LCA 9A as the Proposed Development would only impact a very small area of the overall LCA. The extent of this would depend on the decided option. This would vary from there being 'no change', to the potential, partial, loss of woodland east of Pool Lane.
- 9.5.12 Given the nature of the Proposed Development within the boundary of the SMC, together with the existing industrial context, which is unlikely to change, it is not anticipated there would be significant impacts to wider LCAs. They are therefore scoped out and no sensitive landscape receptors are identified for assessment.
- 9.5.13 The following residential receptors, which are considered to be of high sensitivity, have been identified below:
- residents of Thornton-le-Moors;
 - residents of Elton;

- residents of Ince; and
- residents of Stoak.

9.5.14 With regard to recreational receptors, there are relatively few PRow that lie with the Study Area, most notable of which being National Cycle Network Route 5 that lies to the south of the SMC and extends east and west along the A5117 but then passes through Elton to the east of the SMC.

9.5.15 Recreational users which are considered to be of high sensitivity, have been identified below:

- National Cycle Network Route 5 (NCN 5);
- Shropshire Union Canal and Canal Towpaths Trail;
- Public Footpath 294|FP1/1;
- Public Footpath 294|FP2/1;
- Public Footpath 294|FP3/1;
- Public Footpath 123|FP1/1;
- Public Footpath 123|FP1/2;
- Public Footpath 123|FP3/1;
- Public Footpath 123|FP5; and
- Public Footpath 281 FP1/3.

Future Baseline

9.5.16 In the absence of the Proposed Development, it is likely the majority of the landscape and visual baseline within the Site would remain similar over the assessment years to that of the current baseline with the addition of CHP Phase 1 and Hydrogen Production Plant (HPP), experienced within its current industrial use. With regards to the Study Area and beyond the industrial land uses, current land use and management are predominately related to agricultural land (arable and grazed pasture), thus ecological conditions are unlikely to significantly change over the coming years. Where management lapses over time, natural succession of habitats from grassland to scrub and woodland may occur.

9.5.17 Although species abundance and distribution within the study area may naturally fluctuate, it is assumed there would be no significant changes to species or habitat status aside from natural succession of habitats and natural increases and decreases in species populations and geographic extent. Further detail can be found in **Chapter 7: Biodiversity**.

- 9.5.18 Increased air temperature and increased incidence of heatwaves as well as flooding events (see **Chapter 10: Water Environment and Flood Risk**) could result in fluctuations of species abundance and distribution, which could alter the future baseline.
- 9.5.19 Future industrial developments within the SMC are anticipated as outlined in **Chapter 1: Introduction**. In the Study Area outside of the SMC, future developments, such as industrial, housing and retail developments would be anticipated within urban and suburban areas, which will alter the future baseline potentially adding additional residential receptors

9.6 Description of Likely Significant Effects

Construction Phase

- 9.6.1 During the construction phase, it is noted that increased activity including the demolition of existing redundant infrastructure, and presence of associated plant utilised during construction will introduce new features with the potential to result in some significant effects upon visual receptors within the immediate context of the Site, notably users of NCR5 and residents at Thornton-le-Moors. However, industrial features are a characteristic feature of the landscape within which the Site is located and as such it is considered that effects on the perception of landscape character will be limited.

Operational Phase

- 9.6.2 Once in the operational phase, it is considered that the effects of the presence of the new structures and apparatus associated with the Site will be limited. During operation, it is considered that the Proposed Development in its context of adjacent industrial structures and apparatus, will be barely perceptible within the landscape. Where visible, it is considered that the proposals will be seen as an extension to the existing landscape character and visual environment rather than inherently new features, and as such are unlikely to appear incongruous. The Proposed Development will introduce new industrial structures within an industrial landscape, and it is therefore considered that during the operational phase no significant residual landscape effects are likely to be experienced and the potential for significant visual effects are anticipated to be limited to the very immediate context.

Scope

- 9.6.3 A summary of the proposed scope for the landscape and visual construction and operational phase assessments is presented in **Table 9.5**.

Table 9.5 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Changes to the national landscape character area within the Site Boundary and Study Area as a result of the Proposed Development.	Construction and Operational		✓	Due to the scale of the NCA in relation to the Proposed Development and its construction, it is considered unlikely that the proposals will result in significant effects upon the national landscape character. The proposals will introduce new industrial features into an existing industrial landscape. Consideration as to the Proposed Development's effects upon the NCA have therefore been scoped out of further assessment.
Changes to local landscape character within the Site Boundary and Study Area due to new built form, use of new infrastructure, and landscaping.	Construction and Operational		✓	Due to the scale and nature of the Proposed Development and its construction, that will introduce a new industrial feature into an existing industrial area it is considered that the Proposed Development is unlikely to result in significant impacts upon the local landscape character, introducing features that are already characteristic of the existing landscape.
Changes to existing visual amenity of surrounding sensitive receptors due to construction activities and associated plant.	Construction and Operational	✓		Construction activities required have the potential to create temporary significant effects upon visual amenity through increased activity and movement of associated plant. The addition of new permanent structures during operation, and where viewed at close proximity for highly sensitive receptors such as residents of Thornton-le-Moors and PRowS south of the Site Boundary have the potential to create permanent significant effects upon visual amenity.

Element	Phase	Scoped In	Scoped Out	Justification
Visual receptors beyond 2km from the Site Boundary.	Construction and Operational		✓	Following an initial desktop review and from knowledge of the Site from earlier site visits to identify sensitive landscape and visual receptors, it was concluded that a 2km Study Area was considered appropriate for the type and scale of development proposed. Beyond 2km from the Site Boundary it is considered that the physical separation and level of containment afforded by the existing industrial features associated with SMC is such that no significant effects are likely to be experienced by receptors. Receptors located further than 2km from the Site boundary have therefore been scoped out.
Assessment of night-time effects from lighting.	Construction and Operational		✓	The Proposed Development will be located within the SMC. Lighting associated with the industrial area is already present within the landscape and contributes to the nighttime character of the area. It is not considered that additional lighting introduced as part of the construction or operation of the Proposed Development will result in significant changes to the landscape character or visual amenity of the area, resulting in a minor addition to this existing landscape character. It is therefore considered that night-time effects resulting from the Proposed Development can be scoped out of further assessment.

9.7 Assessment Methodology

9.7.1 The Visual Impact Assessment (VIA) will be undertaken in accordance with best practice guidance, in particular the Landscape Institute and ISEP's GLVIA (Landscape Institute and ISEP, 2013).

- 9.7.2 The VIA will include an illustrated description of the visual impact of the Proposed Development on properties and locations that have public access.
- 9.7.3 The VIA will consider effects on visual receptors within the Study Area during construction and operational phases.
- 9.7.4 A complete version of the proposed VIA methodology has been provided within **Volume 3, Appendix 9.1: Visual Impact Assessment Methodology**.

9.8 Mitigation Measures

- 9.8.1 As an inherent part of the design process, landscape and visual effects will be considered in relation to the Proposed Development.
- 9.8.2 Due to the location of the Site within the SMC, it is considered that potential for additional mitigation is limited. The Site is already afforded a significant degree of screening by the existing industrial features present within SMC and the dense vegetation structure that surrounds the industrial area and in particular abuts the A5117 road corridor to the south.
- 9.8.3 An area of the woodland belt that sits within the south of the SMC fenced boundary may be removed. This would notably open up views towards visual receptors to the south of the Site Boundary, such as residents of Thornton-le-Moors and recreational users of nearby PRow. Further to this, there will be some vegetation removal to the north of the Site to facilitate the back-up power generation capability. However, there are not expected to be views towards this from the visual receptors south of SMC. This is due to the intervening industrial features and boundary vegetation. It should be noted that the site's status as critical national infrastructure does mean that boundary vegetation also has to be balanced with police advice on maintaining a secure perimeter, as well as safety in relation to the potential for vegetation to exacerbate fire risk.
- 9.8.4 There remains the potential that woodland to the north east of the SMC may be impacted to facilitate the construction of a pipeline. The removal of some of this woodland would potentially open up views into the north east of the SMC from the edge of Elton, which may require mitigation measures to be considered.
- 9.8.5 As part of the embedded mitigation, the developing design for the Proposed Development will therefore seek to maintain where reasonably practicable, the existing vegetation structure that lies within the Site to maintain the existing degree of containment afforded to the Proposed Development from wider views to the south and east.

9.9 Assumptions and Limitations

9.9.1

To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The Proposed Development is a fixed location within an industrial area that is afforded visual containment by existing industrial built form and dense vegetation along the A5117. The Proposed Development will retain this vegetation as far as is reasonably practicable, limiting the requirement for additional mitigation measures within the Site.
- The ZTV has been produced in line with a maximum development height of 80m and has utilised Digital Surface Model (DSM) Data to outline likely visibility of the Proposed Development within the Study Area.
- Viewpoint photography to support the visual assessment was collected from publicly accessible locations to represent the likely visibility afforded to identified sensitive receptors.

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PUBLIC

EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 10: Water Environment and Flood
Risk

02-09-2026

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VOLUME 3 APPENDICES

No appendices

10. Water Environment and Flood Risk

10.1 Introduction

- 10.1.1 This chapter considers the potential impacts of the Proposed Development on water environment and flood risk during the construction and operational phases. It sets out the proposed methodology for the water environment and Flood Risk Assessment (FRA) and identifies impacts which can be scoped out of the Environmental Impact Assessment (EIA).
- 10.1.2 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.

10.2 Consultation and Engagement

- 10.2.1 An overview of consultation undertaken for the Proposed Development (to date) is summarised in **Table 10.1**.
- 10.2.2 Engagement undertaken for Combined Heat and Power (CHP) Phase 1 of CHP development is also summarised in **Table 10.1**. CHP Phase 1 comprises a Town and Country Planning Act regime application for the CHP, with determination anticipated later in 2026.
- 10.2.3 The engagement undertaken on CHP Phase 1 to date is relevant to the scoping of the Proposed Development as it has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the subsequent phase of the project.

Table 10.1 Consultation and engagement to date

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
Environment Agency	14 June 2024	Response to baseline data request undertaken for CHP Phase 1. The Environment Agency provided the following data: ■ flood defence map; ■ detailed flood map; ■ modelled water levels; ■ groundwater contour plan; ■ discharge consents; and

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
		■ licence details for active surface water and groundwater abstraction licences.
Cheshire West and Chester Council (as Lead Local Flood Authority (LLFA))	04 July 2024	Pre-application advice was received during engagement undertaken for CHP Phase 1 detailing the requirements for the planning application, which are to include a: ■ Flood Risk Assessment and Drainage Strategy including sustainable drainage systems and consideration of overland flow routes during extreme events; and ■ the Drainage Strategy should include a management and maintenance plan for the lifetime of the Proposed Development in relation to the sustainable drainage systems. A flood risk assessment and drainage strategy will be prepared by EET to support the Phase 2 application.
Environment Agency	27 November 2024	Further consultation from the Environment Agency was provided within the Scoping Opinion for the CHP Phase 1 Environmental Statement (ES) and is noted below. Flood Risk The Environment Agency highlighted their policy against building developments on top of main rivers, including culverted sections of watercourses. They encourage de-culverting sections of the main river network where possible to reduce associated flood risk. Consideration will need to be given as to how surface water (further to the matter of discharge rates) arising from the completed development will be appropriately disposed of. Technical reporting to support the forthcoming planning application should include details of schemes to:

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
		■ dispose of foul water/effluent; ■ dispose of surface water; and ■ treat and remove suspended solids from surface water run-off during construction works. Sustainable Drainage Systems The first option for surface water disposal should be the use of Sustainable Drainage Systems. (SuDS), which encourage infiltration such as soakaways or infiltration trenches, as per the Approved Document Part H of the Building Regulations 2000's drainage hierarchy (HM Government, 2015). Flood Risk Activity Permit The Environmental Permitting (England and Wales) Regulations 2016 require a permit or exemption to be obtained for any flood risk activities as defined by Schedule 25 therein. The Proposed Development would be designed and constructed be in such a way so as to limit or eliminate the need for flood risk activities which would require consent from the Environment Agency in the form of a Flood Risk Activities Permit (FRAP). Specifically, the design of the Proposed Development and the associated construction methodology would be developed to ensure that there would be no impact on both the structural integrity of, and the regulator's access to, the section of the Gale Brook which runs through the Site.
Environment Agency	6 February 2026 (and subsequent correspondence, March 2026)	The Environment Agency issued a formal objection to CHP Phase 1 planning application, citing that the submitted flood risk assessment did not fully comply with the requirements of the Flood Risk and Coastal Planning Practice Guidance and did not adequately demonstrate that the

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
		development would be safe or would not increase flood risk elsewhere. WSP subsequently prepared a detailed response (March 2026) providing clarification and additional information to address these comments. On 2 April 2026, the Environment Agency removed their objection. A request has been submitted to obtain hydraulic modelling data to inform the flood risk assessment for the Proposed Development.
Environment Agency	5 March 2026 (Stakeholder Briefing)	■ overview of CHP; ■ Proposed Development: Programme (key milestones); ■ Proposed Development: cost recovery; and ■ CHP Phase 1: EA response.
Natural England	21 April 2026 (Phase 2 Introductory Briefing)	■ overview of EET and the Stanlow site; ■ overview of the Proposed Development; ■ indicative timeline to Development Consent Order application; and ■ working together.
Environment Agency	27 May 2026	Response to baseline data request undertaken for the Proposed Development. The Environment Agency provided the following data: ■ discharge consents; and ■ licence details for active surface water and groundwater abstraction licences.

- 10.2.4 Feedback in relation to this topic and the scope of works will be gained as part of the Proposed Development Scoping Opinion, and this will inform the production of the ES. Further consultation with the relevant stakeholders will be undertaken to support the ES to ensure that the most up to date data and information is used to inform the assessments.

10.3 Guidance

- 10.3.1 This chapter has, and when undertaking the assessment for the ES, will give consideration to the following guidance:

- National Planning Practice Guidance for Flood Risk and Coastal Change (Ministry of Housing, Communities and Local Government (MHCLG, 2025);
- LA 113 Road Drainage and the Water Environment 2020 (Design Manual for Roads and Bridges (DMRB, 2020);
- National Standards for Sustainable Drainage Systems (Department for Environment & Rural Affairs (Defra, 2025);
- Environment Agency's Flood Risk Assessments: Climate Change Allowances (Environmental Agency, 2022);
- British Standard 8582:2013 Code of practice for surface water management for development sites (BSI, 2019);
- Building Regulations Approved Document H: Drainage and Waste Disposal (Building Regulations, 2010);
- Cheshire West and Chester Level 1 Strategic FRA (Cheshire West and Chester Council (CWCC, 2016);
- Cheshire West and Chester Council Local Flood Risk Management Strategy (CWCC, 2016); and
- Weaver Gowy Catchment Flood Management Plan (Environment Agency, 2009).

10.4 Study Area

- 10.4.1 Study Areas have been identified for surface water receptors, groundwater receptors and flood risk. A description of each of the Study Areas is provided below. The Study Areas have been determined as the potential hydrological and hydrogeological areas of influence that will allow all Water Framework Directive (WFD) water bodies and other features that may be impacted by the Proposed Development to be identified and is based on professional judgement, using knowledge and experience of similar schemes and current knowledge of the area.

The surface water and groundwater Study Areas as well as the local fluvial flood risk are shown on **Volume 2, Figure 10.1: Water Environment and flood Risk Study Area**.

Surface Water

- 10.4.2 The Study Area encompasses sensitive surface water receptors up to, and including, 500m from the Site Boundary. This distance is considered appropriate and proportionate for the assessment due to the relatively flat topography and urban nature of the Site and surrounding area.

Groundwater

- 10.4.3 The groundwater Study Area for assessing potential hydrogeological effects is defined as up to 1km from the Site Boundary. This distance is considered appropriate for the assessment of direct effects on hydrogeology (i.e. water abstractions, groundwater flow and levels and groundwater quality).

Flood Risk

- 10.4.4 The Study Area for the assessment of flood risk has been defined by the extent by which flood risk may be influenced by the Proposed Development and the extent of the relevant Flood Zones. This is driven by the need to consider the potential effects to people and property elsewhere, regardless of their location. Although, for a development such as this it is typical to consider flood risks up to 1km from the Site as there are unlikely to be any effects beyond this distance.

10.5 Baseline Conditions

- 10.5.1 The baseline conditions have been informed by a desk-based assessment of the resources listed below:
- British Geological Survey (BGS), GeoIndex Onshore viewer (BGS, 2026);
 - British Geological Survey, Geology Viewer (BGS, 2026);
 - The Coal Authority Interactive Map (The Coal Authority, 2026);
 - Cheshire West and Chester Level 1 Strategic FRA (CWCC, 2016);
 - Defra 'Multi-Agency Geographic Information for the Countryside (MAGIC) Map' Online GIS Portal (Defra/Environment Agency, 2026);
 - Ordnance Survey (OS) Mapping (OS, 2026);
 - Google Maps, Aerial Imagery (Google, 2026);
 - Environment Agency's Catchment Data Explorer (Environment Agency, 2026);

- Environment Agency's online Flood Map for Planning (Environment Agency, 2026);
- Environment Agency's online Long Term Flood Risk map (Environment Agency, 2026);
- Environment Agency's LiDAR Digital Terrain Model (Environment Agency, 2026);
- Environment Agency surface water and groundwater abstraction data;
- Environment Agency discharge consents data;
- Weaver Gowy Catchment Flood Management Plan 2009;
- United Kingdom (UK) Centre for Ecology and Hydrology's (CEH) Flood Estimation Handbook (FEH) Web Service (CEH, 2026);
- British Geological Survey Solid and Drift Geology 1:50000 (BGS, 1980);
- British Geological Survey Hydrogeological Map 1:100000 (BGS, 1989);
- British Geological Survey Lexicon of Named Rock Units (BGS, 2020); and
- Groundsure Report, Stanlow Refinery, Ellesmere Port, CH65 4HB. Report reference: WSP-5TH-X41-GYO-JOL.

10.5.2 The key water environment receptors are identified on **Volume 2, Figure 10.2: Water Environment Receptors**.

Existing Baseline

Surface Water

10.5.3 There are several watercourses located within the Study Area as summarised below. Watercourse alignments are illustrated in **Volume 2, Figure 10.2: Water Environment Receptors**.

Gale Brook

10.5.4 Gale Brook is a tributary of the River Gowy, flowing through the Site Boundary in a northerly direction and discharging into the River Gowy approximately 80m to the west of the Red Line Boundary. The watercourse is culverted within the Site Boundary, from approximately 15m upstream of the Site to approximately 150m downstream of the Site.

10.5.5 Gale Brook is designated as a main river and is under the jurisdiction of the Environment Agency. According to the UK Centre for Ecology and Hydrology's FEH Web Service (CEH, 2026), the catchment area of Gale Brook is

approximately 6.6km, upstream from the Gale Brook tidal gate and consists of largely rural agricultural land located upstream of the Site and the A5117, extending to the west of Dunham-on-the-Hill.

- 10.5.6 A review of the Environment Agency's Catchment Data Explorer (Environment Agency, 2026) indicates that Gale Brook is not monitored against the objectives of the Water Framework Directive (WFD) and is not located within a WFD waterbody. However, the downstream extent of the nearest WFD waterbody, the Gowy (Milton Brook to Mersey) WFD waterbody catchment (GB112068060250) is located approximately 100m to the west of the Site. Gale Brook discharges into the Mersey WFD transitional waterbody. The upstream extent of the Mersey WFD waterbody catchment is located approximately 90m to the west of the Site.
- 10.5.7 The ecological desk study and site walkover undertaken to inform Chapter 7: Biodiversity (Volume 1) for CHP Phase 1 indicated a lack of mature bankside trees along Gale Brook that would commonly be used by otters for holts or places of shelter, as well as limited connectivity to the wider catchment or estuary habitats to the north of the Site. These findings remain applicable to the Proposed Development. As such it is considered that the section of Gale Brook within the Site Boundary does not offer habitat suitable to support otters.
- 10.5.8 The ecological desk study undertaken to inform **Chapter 7: Biodiversity** for the Proposed Development indicated the presence of suitable habitat to support water vole along the banks of Gale Brook. Surveys to establish the presence or likely absence of water vole have been undertaken which confirmed the likely absence of water vole.
- 10.5.9 The ecological desk study undertaken to inform **Chapter 7: Biodiversity** for the Proposed Development, identified fish including the migratory species European eel from the River Gowy which is hydrologically connected to Gale Brook. Therefore, there is potential for fish including European eel to be present in Gale Brook. The desk study also identified likely presence of aquatic macroinvertebrates adapted to ditch habitat and likely presence of macrophyte species.

Thornton Brook

- 10.5.10 Thornton Brook, a tributary of the River Gowy, is located approximately 30m western boundary of the Site. Thornton Brook flows in a northerly direction before being culverted under the A5117; from here the watercourse flows in an open channel in a northwest direction discharging into the River Gowy immediately adjacent to the west of the Site Boundary.
- 10.5.11 Thornton Brook is designated as a main river and is, therefore, under the jurisdiction of the Environment Agency. The catchment area of Thornton Brook

and its tributaries is approximately 2.3km² at the point of its confluence with the River Gowy according to the UK Centre for Ecology and Hydrology's FEH Web Service (CEH, 2026). The catchment is a mixture of rural agricultural land to the south and industrial land to the north.

- 10.5.12 Thornton Brook and its tributaries are not monitored against the objectives of the WFD but are partially located within the Gowy (Milton Brook to Mersey) WFD waterbody catchment (GB112068060250).
- 10.5.13 A new separate channel diversion for Thornton Brook was established as part of the Stanlow flood alleviation scheme in Stanlow whereby Thornton Brook now flows into the River Gowy within the Gowy Meadows. The Gowy Meadows, located upstream of the Site to the south of the A5117, comprise low-lying grazing marsh intersected by drainage ditches and is designated as a water storage area to protect the Stanlow Manufacturing Complex (SMC). The Cheshire Wildlife Trust manages the land as a Local Wildlife Site (LWS), titled 'Gowy Meadows and Ditches LWS'.
- 10.5.14 As part of the flood defence scheme, tidal gates to Gale Brook, Thornton Brook and the River Gowy were provided to prevent tidal flooding and to control water levels in the Gowy Meadows. The tidal gates are used to produce wetland conditions through winter flooding and a high-water table in the summer months. **Volume 2, Figure 10.3: Site Location Plan with Flood Defence Name** shows the location of the tidal gates.

River Gowy

- 10.5.15 The River Gowy is located approximately 80m from the northwest boundary of the Site, flowing in a northerly direction. The watercourse passes beneath the Manchester Ship Canal via a syphon to discharge to the Mersey Estuary. The River Gowy is under the jurisdiction of the Environment Agency as the watercourse is designated as a main river.
- 10.5.16 While outside of the Study Area, the River Gowy is monitored against the objectives of the WFD and is located within the Gowy (Milton Brook to Mersey) WFD waterbody catchment (GB112068060250). The River Gowy is designated as a heavily modified watercourse. The Gowy (Milton Brook to Mersey) WFD waterbody (GB112068060250) is classified as having a 'Poor' ecological status and a 'Fail' chemical status (2025).
- 10.5.17 The ecological desk study undertaken to inform **Chapter 7: Biodiversity** for the Proposed Development identified fish including the migratory species European eel within the River Gowy. The River Gowy is also hydraulically connected to the Gowy Meadows discussed below.

Gowy Meadows

- 10.5.18 The Gowy Meadows are located approximately 50m upstream of the Site to the south of the A5117 and comprise low-lying grazing marsh intersected by drainage ditches. The site is designated as a water storage area to protect the SMC. The Cheshire Wildlife Trust manages the land as a Local Wildlife Site (LWS), titled 'Gowy Meadows and Ditches LWS'.
- 10.5.19 A new separate channel diversion for Thornton Brook was established as part of the Stanlow flood alleviation scheme whereby Thornton Brook now partially flows into the River Gowy within the Gowy Meadows.
- 10.5.20 The ecological desk study undertaken to inform **Chapter 7: Biodiversity** for the Proposed Development confirmed the likely presence of water vole within the Gowy Meadows.
- 10.5.21 As part of the Stanlow flood alleviation scheme, tidal gates to Gale Brook, Thornton Brook and the River Gowy were provided to prevent tidal flooding and to control water levels in the Gowy Meadows. The tidal gates are used to produce wetland conditions through winter flooding and a high-water table in the summer months.

Other Surface Water Features

- 10.5.22 There are several drainage features located within the Study Area. These features are under the ownership of EET Fuels, the Site operator, for the SMC.

Abstractions and Discharges

- 10.5.23 Data provided by the Environment Agency in May 2026 indicates that there are several licensed surface water abstractions located within the surface water Study Area. These include:
- Licence 2568006113 – Abstraction from the River Gowy at Stanlow, associated with industrial use (Veolia ES UK Ltd).
 - Licence NW/068/0006/016 – Abstraction from Thornton Brook at Stanlow Manufacturing, associated with industrial use (Essar Oil (UK) Ltd).
 - Licence 2568009001 – Abstraction from the Manchester Ship Canal at Ellesmere Port, associated with industrial use (Essar Oil (UK) Ltd). The licence comprises multiple abstraction points within the canal.
- 10.5.24 A permitted surface water discharge is also located within the surface water Study Area. The discharge is associated with Ellesmere Port Sewage Treatment Works (discharge reference 16810030), which outfalls to Thornton Brook. The discharge has a consented dry weather flow of approximately 29,500 m³/day.

Site Designations

- 10.5.25 The Mersey Estuary is hydraulically connected to the Proposed Development as the River Gowy discharges into the River Mersey estuary approximately 1.2km north, downstream of the Proposed Development. The Mersey Estuary is a designated Ramsar site, Special Protected Area (SPA), and Site of Special Scientific Interest (SSSI).

Drainage and Other Surface Water Features

- 10.5.26 The majority of discharge from the Site is conveyed via the pipeline corridors and a below ground network to the existing United Utilities Waste Water Treatment Works (WWTW) located to the southwest of the SMC. The WWTW in turn discharges treated effluent to Thornton Brook.
- 10.5.27 A small portion of the Site along the alignment of existing and proposed pipework to the west of the Site discharges to the Manchester Ship Canal.
- 10.5.28 Part of the existing drainage system serving the western area of the Site includes a high-level overflow to Gale Brook. This occurs during periods of heavy rainfall when the drainage system is hydraulically constrained due to extreme weather.
- 10.5.29 Discharge from the Site and wider SMC is subject to permit and regulated by the Environment Agency (including the overflow to Gale Brook). Discharge is monitored and tested as per the requirements of the environment permits.
- 10.5.30 A public surface water sewer and a foul water sewer run parallel to the A5117, adjacent to the south of the Site.

Groundwater

- 10.5.31 This section outlines the existing localised superficial and bedrock geologies which underly the 1km Study Area for Groundwater.

Superficial Deposits

Geological Description

- 10.5.32 BGS mapping (BGS, 2026) indicates the superficial deposits that underlie a small location within the south Study Area are Alluvium-Clay, silt, sand and gravel deposits of Quaternary age. Alluvium is a general term for clay, silt, sand and gravel. It is the unconsolidated detrital material deposited by a river, stream or other body of running water as a sorted or semi-sorted sediment in the bed of the stream or on its floodplain or delta, or as a cone or fan at the base of a mountain slope (BGS, 2020).

- 10.5.33 BGS mapping (BGS, 2026) indicates the superficial deposits that underlie the northwest of the Study Area are tidal flat deposits of Quaternary age. These form extensive nearly horizontal marshy land in the intertidal zone that is alternately covered and uncovered by the rise and fall of the tide and may form the top surface of a deltaic deposit (BGS, 2020). They consist of unconsolidated sediments, mainly mud and/or sand, establishing mud flats and sand flats interbedded by much darker organic peat deposits.
- 10.5.34 Boulder clay/till of Devensian age made up of diamicton, a type of siliciclastic sediment that is poorly sorted and contains a wide range of clast sizes, underlies the tidal flat deposits within the northwest section of the Study Area and predominantly underlies the rest of the Study Area. Borehole log SJ47NW16 directly adjacent to the west of the Site Boundary confirms this, indicating that the tidal flat deposits extend to a depth of 13.7m below ground level (BGL), overlying the boulder clay/till to a depth of 26.8m BGL (BGS, 2026). The tidal flat deposits disappear and thin out in the southern part of the Study Area as indicated by borehole log SJ47NW17 (situated to the west of the site boundary) as glacial till is encountered to a depth of 13.7m BGL. It is worth noting that the base of the glacial till varies throughout the study Area, as borehole SJ47SW11 indicates a depth to base of 0.9m BGL (BGS, 2026), with BGS 1:50000 geological mapping confirming this with a small section of Sherwood Sandstone bedrock underlying the southeastern part of the Study Area (BGS, 1980).

Hydrogeology

- 10.5.35 The tidal flat deposits have been classified by the BGS/Environment Agency as a secondary aquifer (undifferentiated). The glacial till deposits which cover most of the Study Area have also been designated by the Environment Agency Defra/Environment Agency, 2024) as a secondary aquifer (undifferentiated). Secondary undifferentiated aquifers are designated where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type and have only a minor water resource value. Though no Site-specific information on the hydraulic properties of the tidal flat deposits or glacial till have been identified, based on the aquifer designation and composition of low permeability materials i.e., boulders, clay, peat and silt (Defra/Environment Agency, 2024), the units are generally expected to be a low-productivity aquifers.
- 10.5.36 The tidal flat deposits are classified as having a medium-high groundwater vulnerability with respect to the likelihood of a pollutant released at surface level reaching groundwater.
- 10.5.37 The glacial till deposits are classified as having a medium-low groundwater vulnerability with respect to the likelihood of a pollutant released at surface level reaching groundwater (Defra/Environment Agency, 2024).

- 10.5.38 The Alluvium-Clay, Silt, Sand and Gravel is classified by the BGS/Environment Agency as a Secondary A Aquifer. According to the EA a Secondary A superficial aquifer comprises permeable near-surface deposits (e.g. sands and gravels) capable of supporting local groundwater supplies and providing baseflow to rivers, but with limited regional significance. These deposits have not been classed on EA and Defra mapping.
- 10.5.39 Hydrogeological BGS mapping (BGS, 1989) of the area identifies the area of the Proposed Development to be predominantly underlain by glacial till, alluvial and peat deposits.
- 10.5.40 Groundwater levels are expected to be shallow as shown by historic borehole logs identifying rest water level to sit in the range of 2-4m BGL and are found within the superficial deposits within the Site. Contour mapping of groundwater levels in 2017 from the Environment Agency show the levels within the Site to be located within the 0m Above Ordnance Datum (AOD) contour i.e. shallow. However, it is worth noting that these contours only provide an estimate of groundwater levels within the region at that time and are not suitable for site specific studies.

Bedrock

Geological Description

- 10.5.41 BGS mapping (BGS, 2026) indicated that the bedrock geology directly below the Proposed Development is the Chester Sandstone Formation and the Wilmslow Sandstone Formation of the Sherwood Sandstone Group of Early Triassic age.
- 10.5.42 The Cheshire Sandstone Formation is predominantly aeolian in origin, consisting of conglomerates and reddish brown, cross-bedded, pebbly sandstones with subordinate beds of red-brown mudstones (BGS, 2020).
- 10.5.43 The Wilmslow Sandstone Formation is aeolian in origin and comprises of red-brown to brick-red, fine- to medium-grained, generally pebble-free, cross-bedded sandstones with sporadic siltstones.
- 10.5.44 BGS 1:10000 geological mapping shows that most of the site is covered by superficial deposits above bedrock. However, three areas (southern, central, and a larger northeastern section near the red line boundary) lack this coverage, exposing the Chester Sandstone Formation.

Hydrogeology

- 10.5.45 The Wilmslow and Chester Sandstone Formations form part of the Sherwood Sandstone Aquifer which is identified as a principal aquifer (Defra/Environment Agency, 2024). Principal aquifers provide significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands.

The water quality is likely to be tidally influenced by saline intrusion from the Manchester Ship Canal and Mersey Estuary situated north of the Proposed Development.

- 10.5.46 Hydraulic connectivity is expected between the superficial deposits aquifer and the Sherwood Sandstone Group bedrock aquifer.
- 10.5.47 When no surface protection is anticipated, groundwater vulnerability mapping shows a range from low to high susceptibility.

Springs

- 10.5.48 The available information indicates there are no known springs found to be located within the Study Area.

Groundwater Dependant Terrestrial Ecosystems (GWDTE)

- 10.5.49 According to the current Environment Agency dataset, there are no Groundwater Dependant Terrestrial Ecosystems (GWDTE) recorded within the Study Area. The closest GWDTE is Dibbinsdale (SSSI) located approximately 11.5km northeast of the Study Area (Defra/Environment Agency, 2026).

Source Protection Zones and Groundwater Abstractions

- 10.5.50 The Site is not located within a Source Protection Zone (SPZ). The nearest zone is an SPZ Total Catchment Zone 3 located 3.5km east of the Site and relates to Helsby Pumping Station (Defra/Environment Agency, 2024).
- 10.5.51 Licenced groundwater abstraction data was requested from the Environment Agency on the 24 April 2026 but data has not yet been received at the time of writing. Information on licensed groundwater abstractions, obtained from a Groundsure report dated 28 April 2026, is presented in **Table 10.2**.
- 10.5.52 A request for information on unlicensed private groundwater abstractions was made to West Cheshire and Chester Council on 24 April 2026, but data has not yet been received at the time of writing.

Table 10.2 Groundwater abstraction licence information

Licence No.	Licence Holder	Easting	Northing	No. of abstractions	Approximate distance from Site Boundary
NW/068/0006/011	Essar Oil (UK) LTD	343500	374800	6	400m west of red line boundary.
NW/068/0006/012	University of Chester*	344954	375514	6	Within red line boundary (to the east)
*The University of Chester were the license holders at the time of baseline data collection. The land has since been purchased by EET Fuels in July 2025. The status or future use of these abstractions is currently under review.					

Flood Risk

10.5.53 This section provides a summary of baseline information within the Study Area for flood risk.

Vulnerability Classification

10.5.54 In accordance with Annex 3 (Flood risk vulnerability classification) of the National Planning Policy Framework (NPPF) Flood Risk and Coastal Change PPG (MHCLG, 2025), the Proposed Development and surrounding energy infrastructure are considered ‘essential utility infrastructure’, and is therefore, classified as ‘Essential Infrastructure’ with respect to flood risk.

10.5.55 The transport routes, including the A5117 and railway infrastructure located to the north of the Proposed Development are also considered to be ‘essential transport infrastructure’, and are therefore, classified as ‘Essential Infrastructure’ with respect to flood risk.

10.5.56 The dwellings located to the east and south of the Proposed Development, are classified as ‘More Vulnerable’ with respect to flood risk.

10.5.57 The surrounding land and agricultural buildings are considered to be ‘Less Vulnerable’ with respect to flood risk.

Historic Flood Events

10.5.58 According to the Weaver Gowy Catchment Flood Management Plan (Environment Agency, 2009), in 1997 the failure of a tidal gate caused ‘Stanlow’ to flood, affecting some of the buildings within the SMC.

- 10.5.59 The Cheshire West and Chester Council (2016) Level 1 Strategic Flood Risk Assessment (SFRA) presents the historic fluvial and surface water flooding incidents. There are no incidents recorded within the Site. There is one fluvial flood incident recorded approximately 1km to the north of the Site.

Risk of Flooding from Rivers and Sea

- 10.5.60 The Environment Agency's Flood Map for Planning (Environment Agency, 2026) presents the indicative flood risk to the Proposed Development from fluvial and tidal sources.
- 10.5.61 The flood zones are defined as follows:
- Flood Zone 1 comprises land assessed as having a less than 1 in 1000 annual exceedance probability (AEP) of river or sea flooding in any year (<0.1%).
 - Flood Zone 2 comprises land assessed as having between a 1 in 100 and 1 in 1000 AEP of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 AEP of sea flooding (0.5% – 0.1%) in any year.
 - Flood Zone 3a comprises land assessed as having a 1 in 100 or greater AEP of river flooding (>1%) or a 1 in 200 or greater AEP of flooding from the sea (>0.5%) in any year.
 - Flood Zone 3b comprises land where water must flow or be stored in times of flood. This includes land that would flood with an AEP of 1 in 20 (5%) or 1 in 25 (4%) or greater in any year or is designed to flood in an extreme (0.1%) flood. Also referred to as functional floodplain.
- 10.5.62 The spatial extent of the Flood Zones in relation to the Site is shown in **Volume 2, Figure 10.4: Flood Map for Planning**.
- 10.5.63 Environment Agency mapping and mapping provided within the Cheshire West and Chester Council Level 1 SFRA (2026), indicate that the east of the Site is located within Flood Zone 1, as well as a section towards the south. The west areas of the Site and along the alignment of Gale Brook are shown to be within Flood Zone 2, Flood Zone 3a and Flood Zone 3b.
- 10.5.64 All other data sources relevant to the Site, including site specific hydraulic modelling, will be considered within the FRA and ES to provide an accurate description of flood risk at the Site. According to The Weaver Gowy Catchment Flood Management Plan, the Stanlow flood alleviation scheme includes the Gowy Meadows, a water storage area, as discussed above in **Section 10.5.10**. In addition, flood defences are located along the western section of the SMC, comprising concrete flood walls, tidal gates and embanked channels. The Stanlow flood alleviation scheme provides protection for a 1% fluvial AEP and a 0.5% AEP tidal event.

- 10.5.65 The Cheshire West and Chester Council Level 1 SFRA (2016) describes the main source of flooding to Stanlow to be from the tidal and fluvial River Mersey and fluvial River Gowy and Thornton Brook.
- 10.5.66 The west of the Site and Study Area is located within a Flood Alert and Flood Warning Area, and the land along the alignment of Gale Brook is also within a Flood Alert area. The Environment Agency describe these as geographical areas where flooding is expected to occur and where a flood warning service is provided.

Risk of Flooding from Surface Water

- 10.5.67 The Environment Agency's Risk of Flooding from Surface Water map (Environment Agency, 2026) indicates that the majority of the Site Boundary is located within a very low risk of flooding from surface water sources (defined as land having a less than 0.1% AEP of flooding from surface water).
- 10.5.68 However, there are multiple small areas throughout the Study Area that are located within a low risk (defined as land having between 0.1% - 1.0% AEP), medium risk (defined as land having between 1.0% - 3.3% AEP) and high risk (defined as land having a greater than 3.3% AEP) of flooding from surface water.
- 10.5.69 There are no obvious or significant overland flow routes throughout the Site, including inflows to the Site or outflows from the Site.
- 10.5.70 The mapping suggests surface water flood risk is more likely associated with localised depressions in topography, localised structures such as bunds, and exceedance of local drainage systems.
- 10.5.71 The spatial distribution of surface water flood risk in relation to the Site is shown in **Volume 2, Figure 10.5: Risk of Flooding from Surface Water**.

Risk of Flooding from Groundwater

- 10.5.72 Available groundwater level information indicates the groundwater levels are shallow within the Study Area.
- 10.5.73 According to a Groundsure report received on 28 April 2026, most of the central area of the Site is classified as being at 'moderate risk' for groundwater flooding. The western portion of the Site falls under the 'high risk' category for groundwater flooding.

Sensitive Receptors

- 10.5.74 **Table 10.3** below shows the sensitive receptors identified for the water environment. The Gowy Meadows water storage area has not been included in the table below as it has been scoped out due to the location upstream of the Proposed Development, which means that likely significant effects will not arise.

Table 10.3 Sensitive receptors

Receptor	Sensitivity	Comments
Surface water receptors		
Gale Brook	Low	A main river under the jurisdiction of the Environment Agency. Not located within a Special Area of Conservation (SAC) or SSSI. Q95 river flow expected to be <1.0m ³ /s.
Thornton Brook	Low	A main river under the jurisdiction of the Environment Agency. Not located within a SAC or SSSI. Q95 river flow expected to be <1.0m ³ /s. Surface water abstraction associated with industrial use.
Gowy Brook	Medium	A main river under the jurisdiction of the Environment Agency. Not located within a SAC or SSSI. Current WFD classification is Poor. Surface water abstraction associated with industrial use.
Drainage features	Very Low	Drainage features under the ownership of the Site operator for the oil refinery. Q ₉₅ river flow expected to be <0.001m ³ /s.
Groundwater receptors		
Principal (bedrock) aquifer	High	The Wilmslow and Chester Sandstone Formations form part of the Sherwood Sandstone Aquifer which is identified as a principal aquifer.
Secondary A superficial aquifer	Low	Alluvium-Clay, Silt, Sand and Gravel have been classified as a Secondary A aquifer
Secondary (undifferentiated) superficial deposit aquifer	Low	Tidal flat deposits have been classified as a secondary aquifer (undifferentiated). The glacial till deposits which cover most of the Study Area have been designated as a secondary aquifer (undifferentiated).
Groundwater abstractions (licenced and unlicenced i.e. private)	High	Two licenced groundwater abstractions located within the Study Area for Groundwater.
Flood risk receptors		
NPPF Essential Infrastructure	High	The Proposed Development. Surrounding energy infrastructure. Essential transport

Receptor	Sensitivity	Comments
		routes including the A5117 and railway infrastructure.
NPPF More Vulnerable	Medium	Dwellings located to the east and south of the Proposed Development.
NPPF Less Vulnerable	Low	Land and buildings used for agriculture.

Future Baseline

- 10.5.75 The future baseline has been considered in the context of other committed and reasonably foreseeable developments within the SMC, including CHP Phase 1 and the Hydrogen Production Plant (HPP).
- 10.5.76 These developments may influence future baseline conditions through changes to water demand, wastewater generation, drainage infrastructure and flood risk management measures.
- 10.5.77 Information available at the time of preparation of the ES will be used to establish the future baseline and inform the assessment of cumulative effects.

Surface Water Features

- 10.5.78 There is little expected change to Gale Brook given that it is culverted through the Proposed Development and there are no known plans to change the current form or alignment of the watercourse or no known planned works within the upstream catchment.
- 10.5.79 The WFD objectives for the River Gowy and the Mersy Estuary comprise of achieving 'Good' ecological status by 2027 and 'Good' chemical status by 2063.

Groundwater

- 10.5.80 The future baseline of the Proposed Development is expected to include a rise in groundwater levels in coastal areas due to rising sea levels. This may extend/accentuate saline intrusion. This also may increase the risk of groundwater flooding at the Site.

Flood Risk

- 10.5.81 The most likely change in the baseline conditions in the future would be associated with an increase in peak river flows, peak rainfall intensity and sea level rise associated with the potential effects of climate change.

- 10.5.82 Fluvial, surface water and tidal flood risk is expected to increase as a result of the impacts of climate change which are predicted to result in higher peak fluvial flows, more intense rainfall events and higher sea levels.
- 10.5.83 The Environment Agency provides guidance on a range of potential climate change allowances dependant on the relevant river basin district and climate change probability.
- 10.5.84 The Proposed Development is located within the Weaver Gowy Management Catchment. The Environment Agency's Flood Risk Assessments: Climate Change Allowances guidance (Environment Agency, 2022) for the Weaver Gowy Management Catchment peak rainfall allowances are presented in **Table 10.4**, and the peak river flow allowances are presented in **Table 10.5**. The Environment Agency's Flood Risk Assessments: Climate Change Allowances guidance (Environment Agency, 2022) for the North West River Basin District sea level allowances are presented in **Table 10.6**.
- 10.5.85 The increases in peak rainfall intensity could potentially increase the risk of surface water flooding to the Proposed Development.
- 10.5.86 The increases in peak river flows may increase the frequency, extent and depth of flood risk to the Proposed Development and adjacent receptors and also increase the mapped extent of Flood Zones 2 and 3.
- 10.5.87 The increase in sea level rise could potentially increase the risk of tidal flooding to the Proposed Development.

Table 10.4 Weaver Gowy Management Catchment peak rainfall allowances

	3.3% Annual Exceedance Rainfall Event		1% Annual Exceedance Rainfall Event	
Epoch	Central	Upper End	Central	Upper End
2050s	20	35	25	40
2070s	25	40	30	45

Table 10.5 Weaver Gowy Management Catchment peak river flow allowances

Epoch	Central (%)	Higher (%)	Upper (%)
2020s	19	24	36
2050s	30	40	64
2080s	52	67	106

Table 10.6 North West River Basin District sea level allowances

Epoch	Higher Central (mm)	Upper End (mm)
2000 to 2035	4.5	5.7
2036 to 2065	7.3	9.9
2066 to 2095	10	14.2
2096 to 2125	11.2	16.3
Cumulative rise (2000 to 2125)	1.01	1.41

10.6 Description Of Likely Significant Effects

Construction Phase

Surface Water

- 10.6.1 The potential likely significant effects associated with the construction phase include:
- increased pollution risks from spillage of fuels or other harmful substances that may spill directly into or migrate to surface water features;
 - increased pollution risk from sedimentation caused by surface water runoff from areas of bare earth, construction materials such as aggregate, stockpiles of topsoil or discharge of groundwater dewatering; and
 - flooding of the Site during construction that could pose pollution risk.

Groundwater

- 10.6.2 The potential likely significant effects associated with the construction phase include:
- increased pollution risks from spillage of fuels or other harmful substances that may migrate to groundwater receptors (such as aquifers, licenced and unlicenced (private) abstractions);
 - direct quantitative impact or changes to aquifers and groundwater associated receptors such as licenced and unlicenced (private) abstractions, either within the footprint of the Proposed Development, or as a result of changes to groundwater flows and levels associated with the dewatering of trenches and deep excavations or piling into the aquifer; and

- excavating and/or dewatering near polluted sources (such as scrap yards, service stations, landfills etc.) may mobilise already polluted groundwater; this groundwater has the potential to enter watercourses through dewatering discharge.

Flood Risk

10.6.3 The potential likely significant effects associated with the construction phase include:

- increased flood risk associated with site-generated surface water run-off and increased sediment loading that could also increase flow or reduce conveyance capacity within receiving watercourses and drainage systems;
- flood risk to the Site and adjacent receptors caused by works in areas at risk of flooding from fluvial, tidal and surface water sources.; and
- impermeable structures introduced by the Proposed Development may extend below the water table and impact groundwater flow and levels, locally impacting the groundwater flooding risk.

Operational Phase

Surface Water

10.6.4 The potential likely significant effects associated with the operational phase include:

- Polluted surface water run-off and spillage risks containing silts, hydrocarbons or other harmful chemicals that may migrate or be discharged to surface water features or groundwater features via the proposed drainage system.

Groundwater

10.6.5 The potential likely significant effects associated with the operational phase include:

- The introduction of permanent impermeable structures below the water table potentially permanently impacting groundwater levels and flowpaths, resulting in groundwater mounding and subsequently increasing the risk of groundwater flooding.

Flood Risk

- 10.6.6 The potential likely significant effects associated with the operational phase include:
- increased rates and volumes of surface water run-off from impermeable areas leading to a potential increase in flood risk to the Proposed Development and to people, property and infrastructure elsewhere;
 - flood risk to the Proposed Development and to people, property and infrastructure elsewhere from location of the Proposed Development in areas identified to be at risk of flooding; and
 - impermeable structures introduced by the Proposed Development may extend below the water table and impact groundwater flow and levels, locally impacting the groundwater flooding risks.

Scope

- 10.6.7 A summary of the proposed scope for the water environment and flood risk construction and operational phase assessments is presented in **Table 10.7**.

Table 10.7 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Surface Water				
Quality of surface water features	Construction/ Operational	✓		Construction and operation of the Proposed Development has the potential to impact the quality of surface water features from increased sedimentation and pollution risks.
WFD status of the Gowy (Milton Brook to Mersey) waterbody catchment (GB112068060250) (including biological, physico-chemical and hydromorphological quality elements)	Construction/ Operational		✓	Gale Brook is not located within a WFD monitored waterbody and the impacts to the watercourse are expected to be minimal, due to the watercourse being culverted through the Site Boundary and no changes to the structure of the culvert are assumed as part of the Proposed Development. Risks to the WFD classification of other waterbodies in the local area are considered insignificant. Therefore, a WFD

Element	Phase	Scoped In	Scoped Out	Justification
				Screening Assessment is not considered to be required.
Groundwater				
Principal Aquifers, Secondary A aquifers and Secondary (Undifferentiated) Aquifers	Construction	✓		During the construction of the Proposed Development there is a pollution risk from spillages, material storage and increased turbidity. During construction, excavating and/or dewatering near polluted sources (such as scrap yards, service stations, landfills etc.) may mobilise already polluted groundwater.
Impacts to groundwater flows	Construction/ Operational	✓		Temporary dewatering during construction and long-term underground structures and reinstated ground has the potential to affect the groundwater levels and flows, including the potential for the formation of preferential groundwater flowpaths.
Impacts to groundwater associated users i.e. licenced and unlicenced (private) abstractions (including, as a result of changes to groundwater flows and levels)	Construction	✓		Any dewatering which may be required may have the potential to impact on nearby licenced and unlicenced (private) abstractions. It is unlikely that a significant effect will be incurred because the development will predominantly be founded in low permeability superficial deposits.
GWDTE	Construction		✓	Changes in flows and levels (due to dewatering in construction) have the potential to reduce or cut off groundwater supply to an ecosystem. However, no GWDTEs are located within the Study Area, or within a 10km radius of the Site Boundary.
Springs	Construction		✓	Dewatering during construction may impact levels and flows at springs within the Study Area.

Element	Phase	Scoped In	Scoped Out	Justification
				However, no springs have been identified within the Study Area.
Flood Risk				
Flood risk associated with fluvial and tidal sources	Construction/ Operational	✓		Construction and operation of the Proposed Development could lead to works located in areas at flood risk. Local flood risk could also be associated with a failure of the local flood defences and future climate change.
Flood risk to the Proposed Development and surrounding users (e.g. construction workers, site visitors and staff)	Construction/ Operational	✓		Construction and operation of the Proposed Development has the potential to increase the rate and volume of surface water runoff generated in the area that may increase the risk of flooding in the area or elsewhere.
Groundwater flood risk	Construction/ Operational	✓		Impermeable structures introduced by the Proposed Development may extend below the water table and impact groundwater flow and levels, locally impacting the groundwater flooding risk.

10.7 Mitigation Measures

Surface Water and Flood Risk

Construction Phase

- 10.7.1 During the construction phase, best practice recommendations for the prevention of sedimentation and contamination of watercourses will be outlined in the Outline Code of Construction Practice (CoCP). This includes measures to comply with relevant legislation and guidance, and best practice measures. These are considered to be embedded mitigation.
- 10.7.2 With relevance to the identified water environment and flood risk receptors, potential construction phase embedded mitigation measures for a development of this nature could include, but are not limited to:
- Development of a construction phase flood management plan, building on current flood management practices already implemented throughout the SMC

including awareness training provided to construction workers on the sources/risks of flooding and continued use of the Environment Agency's flood warning system to receive up to date flood warnings.

- Installation of a temporary drainage strategy during the construction phase. This will include full retention separators and collection pits for water quality control, incorporating attenuation features that are intended to remain as part of the operational surface water drainage system.
- Any drainage features or culverts within the Site are mapped and the source identified to maintain the local area drainage and understand/manage pollution transportation risks, most notably that may convey Site-generated pollution to identified watercourses in the Study Area.
- Existing welfare facilities will be used by construction staff with sewage treated offsite as per current arrangements.
- Management of construction pollution using inspection points and plant spill kits to limit migration.
- Appropriate storage measures to be provided for hazardous or polluting materials (e.g. bunded storage of oils).
- Where dewatering is required, a dewatering management plan shall be developed to establish the requirements and methodology of assessment and shall detail the appropriate treatment before discharge.
- Where piling is required, a Piling Works Risk Assessment (PWRA), which assesses the risks associated with piling, including assessing the risk to controlled waters, focusing on pollution prevention and presenting the necessary mitigation and monitoring procedures, should be undertaken.

Operational Phase

10.7.3 Mitigation measures will be embedded into the detailed design of the Proposed Development and included as part of the operation phase assessment as outlined below:

- Review of existing flood response measures within the wider SMC to ensure suitability and application for the Proposed Development, with amendment as required.
- Implementation of a new drainage system that serves the Proposed Development, encompassing surface water, contaminated water and effluent. This system will be designed in accordance with current standards and guidance (National Planning Practice Guidance: Flood Risk and Coastal Change and National Standards for SuDS) to provide appropriate attenuation

and treatment prior to discharge and to maintain compliance with existing environment permits, monitoring and testing requirements.

- Implementation of a management and maintenance plan for the new drainage system throughout the lifetime of the Proposed Development.
- Provision of appropriate spill containment to manage spillage/leakage risk from areas of potential pollution.

Groundwater

Construction Phase

10.7.4 The following measures form part of the embedded mitigation for the Proposed Development and will be secured through the Outline CoCP and detailed design.

- Ground investigation data and the final design of foundations, trenching and excavations will be developed to minimise the requirement for intrusive works below the water table and to limit the duration and extent of temporary dewatering. In areas identified as being at elevated risk of groundwater flooding, including the western extent of the Site, construction design and sequencing will take account of anticipated groundwater levels to maintain safe and dry working conditions.
- Where dewatering is required, it will be designed and implemented in accordance with relevant environmental permitting requirements to control groundwater drawdown and to avoid unacceptable effects on groundwater levels, flow regimes and nearby abstractions. Temporary dewatering and, where necessary, localised cut-off measures will be implemented to manage elevated groundwater levels in higher risk areas.
- Excavations within areas of known or potential contamination will be undertaken in accordance with an appropriate risk assessment. Groundwater encountered during excavation or dewatering will be inspected and, where required, monitored, treated and/or removed off-site to prevent the mobilisation of contaminants.
- Pollution prevention measures will be implemented in accordance with the CoCP and will include, but not be limited to, sealed and bunded storage of fuels, oils and chemicals, designated refuelling areas, and the provision of spill response equipment and procedures.
- Temporary stockpiles, excavated materials and construction plant will be managed in accordance with good practice measures set out in the CoCP to minimise the potential for the infiltration of contaminated runoff to ground. This

will include the use of designated storage areas, appropriate protection from rainfall and routine inspection and maintenance of plant and equipment.

- Piling and other below-ground construction activities will be designed and implemented to avoid the creation of preferential pathways for contaminant migration between superficial deposits and underlying bedrock aquifers.
- Where a plausible pathway exists, pre-construction condition surveys and, where required, monitoring of nearby groundwater abstractions will be undertaken to establish baseline conditions and to enable the identification and management of any unforeseen effects during construction. Monitoring data will also be used, where necessary, to inform the management of groundwater levels in areas at elevated risk of groundwater flooding.

Operational Phase

10.7.5 The following measures form part of the embedded mitigation incorporated within the design of the Proposed Development.

- The site layout and finished levels will be developed having regard to areas of elevated groundwater flood risk, including the western extent of the Site, with finished floor levels and critical infrastructure set with appropriate buffer/design allowance above anticipated groundwater levels.
- The operational drainage strategy will be designed to avoid routine discharge of site-generated surface water runoff or foul water to ground, thereby reducing the potential for long-term groundwater contamination. The drainage design and external levels will also facilitate the management of elevated groundwater levels, including the provision of positive drainage and, where required, localised falls or pumped drainage solutions to prevent the accumulation of groundwater at surface.
- Drainage systems, hardstanding and areas used for the storage or handling of fuels, oils and chemicals will be designed with appropriate containment, interception and isolation measures to prevent infiltration to ground in the event of an accidental release. These measures will be implemented as part of the detailed design.
- Below-ground structures, potentially including foundations, ducts and chambers, will be designed, where practicable, to minimise disruption to natural groundwater flow and to reduce the potential for localised groundwater mounding and increased groundwater flood risk. Where required, below-ground structures will be designed to be resistant to groundwater ingress.
- An inspection, maintenance and repair regime for drainage infrastructure, tanks, pipelines, interceptors and associated containment systems will be

implemented throughout the operational life of the Proposed Development to maintain system integrity and minimise the potential for leaks to ground.

- Operational environmental management procedures will be implemented to control the storage, handling and transfer of potentially polluting materials. These procedures will include appropriate incident response measures to ensure that any leaks or spillages are identified and managed in a timely manner.
- Where required by detailed design, environmental permit conditions or monitoring commitments, groundwater monitoring will be undertaken to demonstrate that the Proposed Development does not give rise to unacceptable effects on groundwater quality, groundwater levels or nearby abstractions, and to verify groundwater level behaviour in areas of elevated groundwater flood risk.

10.8 Assessment Methodology

10.8.1 The approach to the assessment of the Proposed Development will be discussed, and agreement sought with the LLFA (CWCC) and the Environment Agency.

10.8.2 The assessment will be undertaken following the principles set out within the DMRB LA 113 (DMRB, 2020). Although not directly applicable to the nature of the Proposed Development, the DMRB guidance provides a good basis for assessing effects of developments on the water environment and flood risk. The DMRB promotes the following approach:

- Estimation of the sensitivity of the receptor. The sensitivity of the feature or resource is based on the value and sensitivity of the feature or resource as shown in **Table 10.8** below.
- Estimation of the magnitude of the impact. The magnitude of an impact is estimated based on the potential size or scale of change compared to the baseline and is independent to the sensitivity of the receptor as shown in **Table 10.9** below.
- Assessment of the significance of the effect. The overall significance of the effect is based on the sensitivity of the receptor and the magnitude of the impact, as shown in **Table 10.10** below.
- For the purpose of this assessment, project-specific risk levels for both sensitivity and magnitude will be used. These represent a direct reclassification of the DMRB categories for reporting purposes, with no change to the underlying assessment methodology.

10.8.3 **Table 10.8** presents the generic receptor sensitivity criteria that will be used during the assessment, based on the principles of DMRB LA 113. These criteria provide the framework for assigning the sensitivity for each receptor. **Table 10.3** applies these criteria to the receptors specific to the Proposed Development identified within the Study Area and presents the resulting sensitivity that has been assigned.

Table 10.8 Estimating the sensitivity of surface water, groundwater and flood risk attributes

Sensitivity	Criteria	Examples
High	Nationally significant receptor of high sensitivity	- WFD classification shown in a River Basin Management Plan (RBMP) and $Q_{95} \geq 1.0 \text{ m}^3/\text{s}$; or - site protected/designated under EC or UK legislation (SAC, SPA, SSSI, Ramsar site, salmonid water)/species protected by European Community (EC) legislation.
		- principal aquifer providing a regionally important resource and/or supporting a site protected under EC and UK Legislation; - groundwater locally supports GWDTE; and - SPZ 1.
		Essential infrastructure or highly vulnerable development.
Medium	Locally significant receptor of high sensitivity	- watercourse having a WFD classification shown in a RBMP and Q_{95}; and - species protected under EC or UK legislation.
		- principal aquifer providing locally important resource or supporting a river ecosystem; - groundwater supports GWDTE; and - SPZ 2.
		More vulnerable development.
Low	Of moderate quality and rarity	Watercourses not having a WFD classification shown in a RBMP and $Q_{95} > 0.001 \text{ m}^3/\text{s}$.
		- aquifer providing water for agricultural or industrial use with limited connection to surface water; - SPZ 3; and - less vulnerable development.
Very Low	Lower Quality	Watercourses not having a WFD classification shown in a RBMP and $Q_{95} \leq 0.001 \text{ m}^3/\text{s}$.

Sensitivity	Criteria	Examples
		Unproductive strata.
		Water compatible development.

Table 10.9 Estimating the magnitude of an impact on a surface water, groundwater and flood risk attributes

Magnitude	Criteria	Examples
High	Results in loss of receptor and/or quality and integrity of the receptor	- loss or extensive change to a fishery; - loss of regionally important public water supply; - loss or extensive change to a designated nature conservation site; - reduction in water body WFD classification; - loss of, or extensive change to, an aquifer; - loss of regionally important water supply; - potential high risk of pollution to groundwater from routine runoff; - loss of, or extensive change to GWDTE or baseflow contribution to protected surface water bodies; - reduction in water body WFD classification; - loss or significant damage to major structures through subsidence or similar effects; and - increase in peak flood level (> 100mm).
Medium	Affect integrity of receptor, or loss of part of receptor	- Partial loss in productivity of a fishery. - Degradation of regionally important public water supply or loss of major commercial/industrial/agricultural supplies. Contribution to reduction in water body WFD classification. - Partial loss or change to an aquifer. - Degradation of regionally important public water supply or loss of significant commercial/industrial/agricultural supplies. Potential medium risk of pollution to groundwater from routine runoff. - Partial loss of the integrity of GWDTE. - Contribution to reduction in water body WFD classification. - Damage to major structures through subsidence or similar effects or loss of minor structures. - Increase in peak flood level (> 50mm).

Magnitude	Criteria	Examples
Low	Results in some measurable change in receptor's quality or vulnerability	- minor effects on water supplies; - potential low risk of pollution to groundwater from routine runoff; - minor effects on an aquifer, GWDTEs, abstractions and structures; and - increase in peak flood level (> 10mm).
Very Low	Results in effect on receptor, but of insufficient magnitude to affect the use of integrity	- no risk identified to water supplies; - no measurable impact upon an aquifer and/or groundwater; and - negligible change to peak flood level ($\leq \pm 10\text{mm}$).

Surface Water

- 10.8.4 The assessment of potential effects on surface water features will be informed using publicly available information. The water quantity and quality effects will be assessed qualitatively and consider risks to the quality of surface water receptors associated with pollutants typically experienced during construction and operational phase.
- 10.8.5 No water quality sampling or qualitative analysis is proposed.
- 10.8.6 Potential impacts associated with the disturbance of contaminated soils/sediment to controlled waters will be addressed in **Chapter 16: Ground Conditions and Soils**.

Groundwater

- 10.8.7 The desk-study will confirm the potential receptors for the Proposed Development. Ground investigation details together with preliminary design details for below ground works which will be used to assess the impacts on the groundwater conditions within the Study Area.
- 10.8.8 A qualitative assessment of the potential impacts of the Proposed Development on groundwater quality and quantity will be undertaken with respect to identified groundwater abstractions including licenced and unlicenced (private) abstractions, and other groundwater dependent receptors.
- 10.8.9 No water quality sampling or qualitative analysis is proposed.
- 10.8.10 As above, potential impacts associated with the disturbance of contaminated soils to controlled waters will be addressed in **Chapter 16: Ground Conditions and Soils**.

Flood Risk

- 10.8.11 The assessment will consider the likely significant effects of the Proposed Development on flood risk from all sources to people and property elsewhere, as well as the risk of flooding to the Proposed Development. An FRA will be prepared as an appendix to the ES. The assessment of potential effects because of the Proposed Development will consider both the construction and operational phases.
- 10.8.12 The assessment of flood risk during the construction phase will be qualitative and informed by readily available desk-based sources of information.
- 10.8.13 The assessment of flood risk for the operational phase will be both quantitative and qualitative, with the assessment of fluvial and tidal flood risk informed by a site-specific hydraulic modelling study and all other risks informed solely by readily available desk-based sources of information.
- 10.8.14 The assessment of flood risk during operation will take the potential impacts of climate change into account, namely recommended increases in peak river flow, rainfall intensity and sea level rise. It is not proposed to consider the effects of climate change for construction related impacts.
- 10.8.15 The FRA will be supported by a standalone Drainage Strategy that sets out how surface water runoff will be managed during operation of the Proposed Development. The management of surface water flood risk during construction of the Proposed Development is not proposed to be discussed in the FRA or Drainage Strategy and instead will form part of the Outline CoCP.

Significance Criteria

- 10.8.16 The overall significance of effects considers both the sensitivity of the receptor and the magnitude of the impact, using the matrix shown in **Table 10.10** below. The matrix has been adapted from Table 3.8.1 of DMRB LA 104.
- 10.8.17 Only Moderate and Major effects are considered to be significant in EIA terms.

Table 10.10 Matrix to support determining the significance of effect

		Magnitude of Impact (Degree of Change)			
		High	Medium	Low	Very Low
Environmental	High	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Negligible

		Magnitude of Impact (Degree of Change)			
		High	Medium	Low	Very Low
	Low	Moderate	Minor	Negligible	Negligible
	Very Low	Minor	Negligible	Negligible	Negligible

10.9 Assumptions and Limitations

10.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- It is not proposed to undertake hydraulic modelling to inform the assessment of flood risk to the Proposed Development during the construction phase. A site-specific hydraulic modelling study will be undertaken to inform the operational phase of the ES assessment.
- It is not proposed to undertake water quality sampling to inform the assessment of the effects of the Proposed Development on the quality of the surface water features.
- It is not proposed to undertake a quantitative assessment of groundwater impacts. A qualitative assessment based on professional understanding of the geological and hydrogeological conditions will be undertaken.
- It is assumed that there will be no structural changes to the culverted section of Gale Brook as part of the Proposed Development.

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PUBLIC

EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 11: Climate Resilience**

02-09-2026

Document ref: 2026UK550445-ENV-001



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11. Climate Resilience

11.1 Introduction

- 11.1.1 This chapter considers the resilience of the Proposed Development to climate change impacts, including how the design will consider projected impacts of climate change during the construction and operational phases. It sets out the proposed methodology for the Climate Resilience assessment and identifies impacts that can be scoped out of the Environmental Impact Assessment (EIA).
- 11.1.2 The assessment of Climate Resilience interfaces with other environmental topics, and as such, should be considered alongside:
- **Chapter 10: Water Environment and Flood Risk** – which considers flood risk from all sources in relation to the Proposed Development and the potential for this to change with climate change; and
 - **Chapter 18: Major Accidents and Disasters** – which considers extreme weather in relation to the Proposed Development.
- 11.1.3 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.

11.2 Consultation and Engagement

- 11.2.1 There has been no specific consultation carried out in relation to the assessment of Climate Resilience, as data to inform the baseline is obtained from publicly available sources and the potential for likely significant effects is evaluated through the vulnerability assessment (detailed in **Section 11.6**).
- 11.2.2 An overview of engagement undertaken for the Proposed Development (to date) is summarised in **Table 11.1**. The Scoping Opinion for Combined Heat and Power (CHP) Phase 1 agreed with the conclusions on Climate Resilience within the Scoping Report submitted for the CHP Phase 1 Town and Country Planning Application (TCPA). The Scoping Opinion for CHP Phase 1 is relevant to the Scoping of the Proposed Development as it has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the subsequent phase of the Proposed Development.
- 11.2.3 Feedback in relation to this topic and the scope of works will be gained as part of the Proposed Development EIA Scoping Opinion, and this will inform the production of the Environmental Statement (ES).

Table 11.1 Consultation and engagement to date

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
Environment Agency (EA)	05 March 2026 (Stakeholder Briefing)	■ overview of CHP; ■ Proposed Development: Programme (key milestones); ■ Proposed Development: cost recovery; and ■ CHP Phase 1: EA response.
Natural England	21 April 2026 (Phase 2 Introductory Briefing)	■ overview of EET and the Stanlow site; ■ overview of the Proposed Development; ■ indicative timeline to Development Consent Order (DCO) application; and ■ working together.

11.3 Guidance

11.3.1 This chapter has, and when undertaken the assessment will, give consideration to the following guidance:

- Institute of Sustainability and Environmental Professionals (ISEP) (formerly known as IEMA) EIA Guide to: Climate Change Resilience and Adaptation 2020 (ISEP, 2020); and
- ISO 14091:2021 Adaptation to climate change – Guidelines on vulnerability, impacts and risk assessment (ISO14091:2021).

11.3.2 All relevant legislation has been considered in the preparation of this chapter. The EIA will also consider all relevant legislation.

11.4 Study Area

11.4.1 The Study Area for Climate Resilience is the Site of the Proposed Development (i.e. the areas within the Red Line Boundary – see **Volume 2, Figure 1.1: Site Location Plan**).

11.4.2 The climate resilience assessment incorporates future climate covering the 2030s (2020–2049) and the 2050s (2040–2069). These timeframes have been used to identify anticipated climate conditions across the construction period (anticipated to occur in 2028 and 2029) and the design life of 25 years.

11.5 Baseline Conditions

11.5.1 The ISEP Guidance (ISEP, 2020) identifies the need for the baseline to consider:

- the current climate baseline (defined by historic climate conditions) to provide an indication of past vulnerability; and
- the future climate baseline (short term extremes and long term variation) to assess a developments vulnerability to climate change.

11.5.2 This section provides an overview of the current baseline conditions and the projected future changes in climate variables for the Study Area, which has been undertaken using publicly available data sources outlined in **Table 11.2**.

Table 11.2 Data sources

Source	Summary	Coverage of study area
Met Office records for United Kingdom (UK) Climate averages (Met Office, 2021)	Provides historical observed climate data.	Data captured from the Hawarden climate station located approximately 12.9km from the Site.
State of the UK Climate Report 2024 (Kendon <i>et al.</i> , 2025)	Provides a summary of the observed UK climate trends.	Applicable to the UK.
Met Office North West England & Isle of Man: Climate (Met Office, 2016)	This document describes the main features of the climate for the region over a 30-year average period of 1981-2010.	Applicable to the North West England and North Wales region where the Site is located.
UK Climate Projections 2018 (UKCP18) (Met Office, 2018)	Provides climate change projection data for the 25km grid square for probabilistic projections.	The Climate Risk Indicators and UKCP18 websites were used to extract projection data for the Local Authority area of Cheshire West and Chester Council (CWCC), where the Proposed Development is located. This data set is considered representative of Site for the consideration of future climate trends. Where quantitative data is unavailable, UKCP18 Factsheets have been used.
UK Climate Risk Indicators (Nigel Arnell <i>et al.</i> , 2021)	Provides climate change projection data and indicators.	
UKCP18 Derived Projections of Future Climate over the UK (Met Office, 2018a)	Describes derived projection trends where 25km data is unavailable.	
UKCP18 Factsheet: Wind (Fung <i>et al.</i> , 2018)	Summarises UKCP18 data over land for wind metrics.	
UKCP18 Factsheet: Snow (Piret <i>et al.</i> , 2021)	Summarises UKCP18 data over land for snow metrics.	

Source	Summary	Coverage of study area
National Oceanography Centre (NOC, 2025)	Historic sea level trends.	Used to infer the current baseline sea level data from Liverpool Gladstone Dock as the closest location providing recent data, approximately 23km North West of the Site.

Existing Baseline

- 11.5.3 This section provides a summary of the climate trends over the past three decades for precipitation (rain and snow), temperature, relative humidity, wind and sea level for the Study Area. This is presented against the UK context as well as the regional climate, as represented by the North West England and North Wales region. Due to the availability of sources of information, the climate period considered for the baseline can vary.

UK Context

- 11.5.4 According to the latest State of the UK Climate 2024 Report (published 2025) (Kendon *et al.*, 2025), the UK's climate is changing. Recent decades have been warmer, wetter, and sunnier than the 20th century on a national and local scale. This report highlights that the UK land temperatures over the last decade have warmed by 1.24°C compared to 1961-1990, which is at a broadly consistent, though slightly higher, rate than the observed change of 1.23°C for global mean surface temperatures over land. The key findings from the report are:
- The last three years have been in the UK's top five warmest on record.
 - The average highest maximum temperature within the UK over the most recent decade 2015-2024, 35.9°C, was 2.3°C higher than 1991-2020 and 4.5°C higher than 1961-1990.
 - The UK's average lowest minimum temperature over the most recent decade 2015-2024 was 0.4°C higher than 1991-2020 and 3.9°C higher than 1961-1990.
 - The number of days with temperature anomalies exceeding the 1961-1990 average by 5°C has doubled, by 8°C has trebled, and by 10°C has quadrupled for the most recent decade 2015-2024.
 - The UK's climate has become steadily wetter since the 1980s, due to an increase in October to March rainfall. Observations suggest a slight increase in heavy rainfall across the UK in recent decades.

- Six of the 10 wettest October to March time periods within the UK have occurred in the 21st Century so far. October 2023 to March 2024 was the wettest winter half-year on record, measuring 827mm of rainfall.
- October to March rainfall for the most recent decade 2015-2024 has been 6% wetter than 1991-2020 and 16% wetter than 1961-1990, compared to little change for April to September.
- 2024 was the UK's 13th wettest year in the series from 1836 with 109% of average rainfall, the sixth wettest winter (December to February), and the sixth wettest spring (March to May).
- The UK annual mean wind speed from 1969-2024 shows a downward trend, consistent with that observed globally.
- Nine named storms hit the UK in 2024, in comparison to 12 named storms in 2023. Red warnings were issued for Isha in January and Darragh in December 2024.
- Between 1993-2024, UK sea level has risen by 13.4cm. This is higher than the global estimate of 10.6cm calculated from satellite altimetry over the same period, indicating that sea levels around the UK are rising faster than the global average. However, there are large uncertainties in estimates of sea level rise around the UK as these are defined using a limited number of tide gauge records in comparison to global sea level, which is calculated from satellite altimetry data.
- The last three years (2022, 2023 and 2024) were the three highest on record for UK annual mean sea level in a series from 1901, with 17 of the highest years occurring between 2001 and 2024.

Regional Climate

- 11.5.5 The North West has a wide range of climate variability, due to its topography and altitude, and this region contains both the coldest place and wettest place in England. Temperatures in this region are generally affected by altitude and proximity to the coast. The exposure of the region to westerly maritime air masses, in addition to the areas of high altitude, results in the region containing some of the wettest places in the UK (Met Office, 2016).
- 11.5.6 Key features of the climate that have defined the area include:
- Mean annual temperatures over the region depend very much on altitude and, to some extent, proximity to the coast. Lower lying areas are typically warmer with an average 0.5°C decrease in temperature for every 100 meters increase in altitude. Average minimum temperatures were coldest in February (1.4°C)

and January (1.5°C). The number of air frost days were greater in January (10.4 days). The warmest month is July with average maximum temperatures of around 19.2°C. Daily maximum temperatures in Cheshire are higher, approximately 21°C). Extreme temperatures have been experienced in the region in this period, which includes a new national record of 37.1°C at Hawarden Airport, Flintshire on 18 July 2022. (Met Office, 2022).

- Rainfall has been generally well-distributed throughout the year with a seasonal pattern. March was the driest month on average with 89.2mm of rainfall, and December the wettest with 155.3mm.
- The total number of days with rainfall of 1mm or more ('wet days') can reach 50-60 days within winter, decreasing to 40-45 days in summer. Cheshire and Merseyside are typically drier with 35-40 days in winter and about 30 days in summer.
- The region is prone to widespread flooding, especially in winter and early spring. There have been a number of severe flooding events over this period. The period from late December 2024 to early January 2025 brought some very wet and windy weather, with significant snowfalls across upland areas in the north. 31 December was the second-wettest day on record for the climate district of North West England and North Wales (Met Office, 2025). From 21 to 23 May 2024, North West England experienced exceptionally wet weather associated with a slow-moving low-pressure system, with rainfall totals exceeding 50mm across much of the region and reaching 75-100mm in the wettest locations (Met Office, 2024).
- The occurrence of thunderstorms correlates with the heaviest falls of rain, often associated with summer thunderstorms. It is typical that there will be 8-12 thunderstorm days per year.
- The North West region is also amongst the most exposed parts of the UK due to the coastal areas of the Atlantic and the large upland areas. Mean wind speeds and gusts are the strongest between December to February. Wind exposure can also be measured in the number of days gale force is reached; if wind reaches a mean speed of 34 knots or more over any ten consecutive minutes, this is classed as a gale day. On the mainland within the region, gales occur along the coast for around 5-10 days and less than 5 days in inland areas.

Local Climate

- 11.5.7 The nearest Met Office climate station to the Study Area is Hawarden climate station (approximately 12km south west of the Study Area). The data has been used to understand historic baseline conditions associated with the Study Area

(1981-2010) and how climate change has already impacted the Study Area by comparison with the current data (1991-2020).

Precipitation – Rainfall

- 11.5.8 Average seasonal rainfall recorded at Hawarden, North West England and north Wales, and the UK for the periods 1981-2010 and 1991-2020 are presented in **Table 11.3**. It demonstrates that the local weather is drier than both the region and the UK average year-round, particularly during winter. The data show an increase in average precipitation for both the summer and winter seasons at the Study Area from the historic baseline to the current baseline. This is also reflected at the regional and national level.
- 11.5.9 The data have been aggregated for seasonal rainfall, where summer comprises the months June, July and August, and winter comprises December, January and February.

Table 11.3 Average seasonal rainfall (mm)

Season	Average seasonal rainfall (1981-2010) (mm)			Average seasonal rainfall (1991-2020) (mm)		
	Hawarden Climate Station	North West England and North Wales	UK	Hawarden Climate Station	North West England and North Wales	UK
Summer	173	275	238	183	297	253
Winter	179	375	328	185	399	345

Precipitation – Snow

- 11.5.10 Snowfall is closely linked with temperature, with snowfalls rarely occurring if the temperature is higher than 4°C. The area local to the Study Area experiences less snow days than the surrounding areas (Met Office, 2016), largely due to the low-lying nature of the Study Area in relation to North West England and north Wales.

Temperature

- 11.5.11 **Table 11.4** shows the long-term average seasonal mean temperature for Hawarden climate station, North West England and north Wales and the UK for 1981-2010 and 1991-2020. It shows that the Study Area is warmer than both the region and the UK average. An increasing trend in temperature is also visible across both seasons at the Study Area in the current baseline, compared to the historic baseline.

- 11.5.12 The data has been averaged for seasonal temperatures, where summer comprises the months June, July and August, and winter comprises December, January and February.

Table 11.4 Average seasonal temperature (°C)

Season	Average seasonal temperature (1981-2010) (°C)			Average seasonal temperature (1991-2020) (°C)		
	Hawarden Climate Station	North West England and North Wales	UK	Hawarden Climate Station	North West England and North Wales	UK
Summer	15.7	14.4	14.4	15.9	14.6	14.6
Winter	4.8	3.9	3.7	5.2	4.2	4.1

Relative Humidity

- 11.5.13 The average relative humidity can be inferred for the Study Area from the average maps at Hawarden (Met Office, 2021). For the summer months, the Study Area has experienced an average relative humidity of approximately 76-80% and in winter the average relative humidity is approximately 82-86%. Both are typical for North West England and north Wales.

Wind

- 11.5.14 Although the regional baseline is more exposed due to the coastal environment, the Study Area is more sheltered and experiences on average lower wind speeds than the surrounding areas (Met Office, 2016). In general, the strongest winds are associated with the passage of deep depressions across or close to the UK. The frequency and strength of these depressions is greatest in the winter, especially from December to February, and this is when mean speeds and gusts (short duration peak values) are strongest. There are no discernible trends in storminess and wind gusts over the last four decades (Fung *et al.*, 2018) although the local area has experienced major weather events across the baseline period considered, including storms causing heavy rains, high winds and flooding (Met Office, 2025).

Sea Level Rise

- 11.5.15 The National Oceanography Centre at the nearest tide gauge station at Liverpool Gladstone Lock (NOC, 2025) has been recording sea level data since 1991, with the last update in May 2025. The annual mean sea level data show that sea level has risen from 7,018mm in 1992 to 7,202mm in 2015, the last year of complete

data. Annual average data can be inferred from the three monthly data points in 2024 which indicates that sea level was approximately 7,278mm on average in 2024.

Future Baseline

- 11.5.16 The UK Climate Projections 2018 (UKCP18) (Met Office, 2018) probabilistic projections for Representative Concentration Pathways (RCP) 8.5 (high emission scenarios) have been used to infer future changes in a range of climate variables that may affect the vulnerability of the Proposed Development to climate change. The Climate Risk Indicators (CRI, 2021) utilises the UKCP18 Projections and allows for a range of climate related indicators to be derived (including but not limited to, Met Office heatwaves and heat stress). The CRI data for the local authority of CWCC has been used to inform this Scoping assessment and will be used to inform the ES as it is considered to represent the Study Area.
- 11.5.17 The future climate has been presented for the 2030s (2020-2049) and the 2050s (2040-2069) to identify the anticipated climate conditions across the construction period (anticipated to occur in 2028 and 2029) and a design life of 25 years. These projections are provided against the baseline data provided above for the periods of 1981-2010 (based on model data), and 1991-2020 (current climate (where available)) as an indication of change from the baseline period.
- 11.5.18 Although the assessment has been undertaken for the 50th percentile (i.e. the median, or central estimate) the 10th and the 90th percentiles are presented here to illustrate the range of projected outcomes.
- 11.5.19 For the UK, climate change is projected to lead to warmer, wetter winters and hotter, drier summers, with an increase in the intensity and frequency of extreme events such as heatwaves, drought, extreme rainfall leading to flash flooding, storms, and wind events. The information presented below illustrates how the climate may evolve at the Study Area over the design life of the Proposed Development.

Rainfall and Temperature

- 11.5.20 **Table 11.5** provides an overview of current and projected summer and winter temperature and rainfall for the location of the Proposed Development for CWCC.
- 11.5.21 Indicators of climate risk are shown in **Table 11.6**. These provide an indication of specific thresholds that are projected to change in the future. The indicators presented in **Table 11.6** are provided against the model reference period of 1981-2010. These indicators are unavailable for the current baseline period (1991-2020).

Table 11.5 Temperature and rainfall trends

Climate Variable	Model Reference (1981-2010)	Current Baseline (1991-2020)	Measure of change within RCP8.5	RCP8.5 50th percentile (10th-90th percentile)	
				2030s	2050s
Average summer temperature (°C)	15.7	15.9	°C change	1.2 (0.5-2.0)	2.3 (1.0-3.6)
Average winter temperature (°C)	4.8	5.2	°C change	0.9 (0.2-1.6)	1.6 (0.6-2.7)
Min winter temperature (°C)	1.5	2.0	°C change	0.9 (0.2-1.7)	1.6 (0.5-2.8)
Max summer temperature (°C)	20.2	20.4	°C change	1.4 (0.4- 2.4)	2.5 (1.0-4.1)
Average summer rainfall (mm)	173	183	% change	-6.4 (-21.7-8.1)	-15.8 (-35.6-2.6)
Average winter rainfall (mm)	179	185	% change	1.5 (-5.3-9.3)	4.9 (-4.6-15.9)

Table 11.6 Climate risk indicators

Climate Indicator	Model Reference (1981-2010)	RCP8.5 50th percentile (10th-90th percentile)	
		2030s	2050s
Met office heatwave ¹ (events per year)	0.8	1.5 (0.9-2.3)	2.5 (1.3-4.2)
Road accident risk ² (days per year)	41.7	31.2 (24.0-38.7)	24.3 (15.9-34.6)
Road melt risk (days per year) ³	9.4	16.9 (11.5-24.2)	26.9 (14.9-45.9)
Heat stress ⁴ (days per year)	0.0	0.2 (0.1-0.6)	0.9 (0.2-2.6)

¹ A UK heatwave threshold is met when a location records a period of at least three consecutive days with daily maximum temperatures meeting or exceeding the heatwave temperature threshold. The threshold for the local area is 25°C.

² Days with minimum temperature below 0°C.

³ Days with maximum temperature above 25°C.

⁴ Days with shade Wet Bulb Globe Temperature (WBGT) above 25°C.

Climate Indicator	Model Reference (1981-2010)	RCP8.5 50th percentile (10th-90th percentile)	
		2030s	2050s
Wildfire events ⁵ (days per year)	11.9	18.9 (11.3-32.2)	29.0 (13.4-54.3)

Precipitation – Snow

- 11.5.22 Rising winter temperatures are likely to reduce the amount of precipitation that falls as snow and the number of days with lying snow. Snowfall data is unavailable for the probabilistic projections (25km) of UKCP18, however the UKCP18 Factsheet (Pirret *et al.*, 2025) describes a decrease in falling and lying snow relative to the baseline 1981-2000 of approximately 60 to 80% and 80 to 100% respectively under RCP8.5.

Humidity

- 11.5.23 Relative humidity is a function of air temperatures and water vapour content. Changes in relative humidity are expected to be minimal in summer and winter with a slight decrease (-2 to -6%) in summer due to high temperatures and drying, and a small increase (0 to 2%) in winter due to increase precipitation and water vapour. (Met Office, 2018).

Soil Moisture

- 11.5.24 **Table 11.7** indicates the projected changes in soil moisture for the summer and winter months for the North West England region (Nigel Arnell *et al.*, 2021). Changes in soil moisture are anticipated to be at the greatest in summer and autumn, with little change during winter and spring. These dry periods are anticipated to be longer and deeper with climate change, as it is a function of increased evaporation due to higher temperatures and a decrease in precipitation. This is reflected in **Table 11.7**.

⁵ Days with Met Office Wildfire Index at the Very High Fire Severity level or above.

Table 11.7 Soil moisture content projections

Climate Variable	RCP8.5 50th percentile (10th-90th percentile)	
	2030s	2050s
Soil Moisture (% change - winter)	-0.09 (-1.13-0.53)	0.06 (-1.27-0.85)
Soil Moisture (% change - summer)	-13.16 (-25.62-8.30)	-21.34 (-35.00-15.25)

Wind

- 11.5.25 While climate projections are based on current scientific understanding, wind projections remain highly uncertain. According to the Met Office UKCP18 Factsheet on Wind there have been no significant trends in maximum gust speeds recorded by the UK wind network over the last four decades (Fung *et al.*, 2025).
- 11.5.26 Global projections for the UK suggest an increase in near-surface wind speeds during winter in the latter half of the 21st century (Fung *et al.*, 2025). In addition, a recent study of weather systems in the UK (Pope *et al.*, 2021) indicates that the British Isles may experience more frequent westerly storm events in winter, characterised by strong winds and heavy rain, along with a shift towards warmer and wetter winter conditions. Although the frequency of these events is expected to rise, the study also notes a decrease in their duration, meaning these patterns may persist for shorter periods.

Sea Level Rise and Flood Risk

- 11.5.27 The Site is located within the Weaver Gowry Catchment flood plain, and both fluvial and tidal flood risk are present. The recent construction of the Stanlow flood alleviation scheme provides protection for a 1% Annual Probability Event (AEP) and a 0.5% tidal event by flood defences made up of concrete flood walls, tidal flaps, and embanked channels through the oil refinery complex.
- 11.5.28 The future baseline of the Proposed Development is expected to include a rise in groundwater levels in coastal areas due to rising sea levels. This may extend/accentuate saline intrusion.
- 11.5.29 Sea level projections from the marine projections data point at the Proposed Development location, range from 0.12m in the 2030s 10th percentile to 0.39m in the 2080s 90th percentile. **Table 11.8** depicts the projected sea level rise for the 2030s and 2050s using UKCP18 marine projections data.

Table 11.8 Sea level rise projection (m)

Climate Variable	RCP8.5 50th percentile (10th-90th percentile)	
	2030s	2050s
Sea level rise (m)	0.16 (0.12-0.21)	0.29 (0.21-0.39)

11.5.30 Further information regarding sea level rise and flooding from all sources can be found in **Chapter 10: Water Environment and Flood Risk**.

11.6 Description Of Likely Significant Effects

- 11.6.1 The ISEP Guidance (ISEP, 2020) outlines that the Scoping stage should identify the key climatic variables relevant to the Proposed Development and likely effects. However, it is not prescriptive in how this is undertaken.
- 11.6.2 The future baseline presented in **Section 11.5** has therefore been analysed to provide an understanding of the climate trends that have the potential to affect the Proposed Development. The climate variables have been assessed for the time periods across the Proposed Development lifetime of 25 years.
- 11.6.3 The vulnerability assessment is the outcome of an assessment of sensitivity and exposure of the receptors identified to the climate trends presented in **Section 11.5**. The vulnerability assessment has been undertaken for all phases of the Proposed Development in order to identify the impacts with a likely significant effect.
- 11.6.4 The exposure and sensitivity of the receptor to climate impacts is assigned a level of vulnerability as shown in the matrix in **Table 11.9**.

Table 11.9 Vulnerability matrix for scoping

Sensitivity	Exposure		
	Low	Medium	High
Low	Low vulnerability	Low vulnerability	Low vulnerability
Moderate	Low vulnerability	Medium vulnerability	Medium vulnerability
High	Low vulnerability	Medium vulnerability	High vulnerability

- 11.6.5 Sensitivity refers to the degree of response of the receptor to a change and its capacity to accommodate and recover from a change should it be affected. The typical ‘sensitivity’ of receptors to climate variables considers the impact of the climate on the specific receptors, considering any embedded design measures at this stage (as detailed in **Section 11.7**). Sensitivity is rated as high, moderate, or low. ‘High sensitivity’ implies that the receptor will lose much of its original form and function; ‘moderate sensitivity’ implies that the receptor is able to tolerate some climatic conditions without being fully altered though remains susceptible to be altered to some extent and ‘low sensitivity’ implies that projected changes in the climate variables have little influence on the receptor.
- 11.6.6 Exposure is the nature and degree to which climate variations may pose a risk to the Proposed Development. The ‘exposure’ of receptors to projected change in climate variables based on the current climate and the future projections identified in the baseline information presented in **Section 11.5** is rated as high, medium or low. The construction phase is assessed as exposure to the climate trends of the ‘2030s’ (2020-2049) and the operational phase considers the climate trends for the ‘2030s’ (2020-2049) and 2050s (2040-2069).
- 11.6.7 On completion of the vulnerability assessment, climate variables in the construction and operational phase to which the Proposed Development is likely to have a low vulnerability are scoped out of further assessment as no potential for likely significant effects is identified. Climate variables in the construction and operational phases to which the Proposed Development is likely to have a medium or high vulnerability are taken forward for further assessment at the next stage as these variables are identified as having the potential for likely significant effects.

Construction Phase

- 11.6.8 The construction period for the Proposed Development is expected to start in quarter 4 2028 with an estimated 16-month construction programme, including a period of demolition of existing redundant infrastructure. The receptors during the construction phase include:
- the construction site including equipment and materials;
 - demolition of existing redundant infrastructure such as the poly store, shelters, substation and Tenko building; and
 - construction workers.
- 11.6.9 The receptors during the construction phase could be exposed to trends in climate variables during the construction period such as heatwaves events, which may pose health risks to sensitive receptors such as construction workers and could disrupt the operation of plant and machinery.

- 11.6.10 The construction site and demolition works could also be exposed to extreme weather such as heavy rainfall events, which could cause damage to sensitive areas of the construction sites. This may include localised flooding and waterlogging of the construction site, or degradation of stockpiled materials and excavations.
- 11.6.11 Other climate change variables which the construction phase could be exposed to include high wind and storm events, based on the history of major storm events in the region. The receptors sensitive to this include plant and equipment and the construction workers, particularly if working at height.
- 11.6.12 **Table 11.10** presents the assessment of vulnerability of the Proposed Development during the construction phase. This takes into account the exposure (based on current and future baseline conditions in **Section 11.5**) and sensitivity taking into account any design, mitigation and enhancement measures in **Section 11.7**).

Table 11.10 Vulnerability assessment for the construction phase

Receptor	Climate variable	Associated climate hazard	Exposure (at 2030s)	Sensitivity	Vulnerability
Construction Site	Precipitation	Increased frequency, volume and/or duration of extreme precipitation events (flooding).	Low	Low	Low – due to measures anticipated to be in the Outline Code of Construction Practice (CoCP).
		Decrease in summer rainfall and/or prolonged dry spells, affecting water availability.	Low	Low	Low – due to measures anticipated to be in the Outline CoCP and limited exposure.
	Temperature	Increase in the frequency and intensity of hot days and prolonged hot spell events.	Low	Low	Low – due to measures anticipated to be in the Outline CoCP.
		Increasing frequency and intensity of hot and dry conditions.	Low	Low	Low – due to measures anticipated to be in the Outline CoCP.
	Soil moisture	Changes in soil moisture content coupled with increasing frequency and intensity of hot days.	Low	Low	Low – due to limited exposure and low sensitivity of asset.
	Humidity	Changes in relative humidity.	Low	Low	Low – due to limited exposure and low sensitivity of asset.
	Storms	Increased intensity of wind and storm events including high winds, lightning, wind-blown rain, dust storms and blizzards.	Medium	Low	Low – due to measures anticipated to be in the Outline CoCP.

Receptor	Climate variable	Associated climate hazard	Exposure (at 2030s)	Sensitivity	Vulnerability
	Sea level	Increased mean sea level and high tides.	Low	Moderate	Low – due to limited exposure.
Demolition of existing redundant infrastructure (poly store, shelters, substation & Tenko building)	Precipitation	Increased frequency, volume and/or duration of extreme precipitation events (flooding).	Medium	Low	Low – due to measures anticipated to be in the Outline CoCP.
		Decrease in summer rainfall and/or prolonged dry spells, affecting water availability.	Low	Low	Low – due to measures anticipated to be in the Outline CoCP and limited exposure.
	Temperature	Increase in the frequency and intensity of hot days and prolonged hot spell events.	Low	Low	Low – due to measures anticipated to be in the Outline CoCP.
		Increasing frequency and intensity of hot and dry conditions.	Low	Low	Low – due to measures anticipated to be in the Outline CoCP.
	Soil Moisture	Changes in soil moisture content coupled with increasing frequency and intensity of hot days.	Low	Low	Low – due to limited exposure and low sensitivity of asset.
	Humidity	Changes in relative humidity.	Low	Low	Low – due to limited exposure and low sensitivity of asset.
	Storms	Increased intensity of wind and storm events including high winds, lightning, wind-blown rain, dust storms and blizzards.	Medium	Low	Low – due to measures anticipated to be in the Outline CoCP.

Receptor	Climate variable	Associated climate hazard	Exposure (at 2030s)	Sensitivity	Vulnerability
	Sea level	Increased mean sea level and saltwater intrusion.	Low	Moderate	Low – due to limited exposure.
Construction workers	Precipitation	Increased frequency, volume and/or duration of extreme precipitation events (flooding).	Low	Low	Low – due to measures anticipated to be in the Outline CoCP and limited exposure.
		Decrease in summer rainfall and/or prolonged dry spells, affecting water availability.	Low	Low	Low – due to measures anticipated to be in the Outline CoCP and limited exposure.
	Temperature	Increase in the frequency and intensity of hot days and prolonged hot spell events.	Low	Moderate	Low – due to measures anticipated to be in the Outline CoCP.
		Increasing frequency and intensity of hot and dry conditions.	Low	Moderate	Low – due to measures anticipated to be in the Outline CoCP.
	Soil Moisture	Changes in soil moisture content coupled with increasing frequency and intensity of hot days.	Low	Low	Low – due to limited exposure and low receptor sensitivity.
	Humidity	Changes in relative humidity.	Low	Low	Low – due to limited exposure.
	Storms	Increased intensity of wind and storm events including high winds, lightning, wind-blown rain, dust storms and blizzards.	Low	Moderate	Low – due to measures anticipated to be in the Outline CoCP.

Receptor	Climate variable	Associated climate hazard	Exposure (at 2030s)	Sensitivity	Vulnerability
	Sea level	Increased mean sea level and high tides	Low	Low	Low – due to limited exposure and low receptor sensitivity.

- 11.6.13 The results of the vulnerability assessment for the construction phase show that 'low' vulnerability has been identified for all climate variables. This is on the basis that, in line with best practice, construction design and management and health and safety requirements. the Outline CoCP will include measures to manage the risks from weather-related events and reduce the sensitivity of the receptors to the climate variables. As stated above, variables with a 'low' vulnerability are not anticipated to result in any likely significant effects. Therefore, no likely significant effects are identified in the construction phase.

Operational Phase

- 11.6.14 The design life of the Proposed Development is anticipated to be 25 years. Some sub-assets will have shorter design lives within the overall design life which is taken into consideration during the assessment of the operational phase.
- 11.6.15 Based on the Proposed Development description within **Chapter 2: The Proposed Development**, the following receptors will be considered during the assessment of the operational phase:
- power generation assets incorporating the Gas Turbines (GTs), Heat Recovery Steam Generators (HRSG), steam turbine generators and back-up gas powered engines;
 - ancillary equipment and Mechanical, Electrical, Plumbing and Heating (MEPH) assets incorporating the condensing and cooling equipment, substation, pipe racks, fuel and chemical dosing equipment, deaerators and boiler feedwater pumps; and
 - site staff.
- 11.6.16 The exposure to increasing ambient temperatures across the design life can impact sensitive assets by overheating. High temperatures can also affect staff through sensitivity to heat and relative humidity. Hot and dry conditions can also expose the assets to wildfires.
- 11.6.17 A decrease in precipitation leading to drought conditions could affect the operations of the turbines and the demineralisation water plant which relies on water to function. Drought conditions can also affect foundations of assets, cabling and drainage through ground movement.
- 11.6.18 Storm events can expose the assets to high winds, driving rain, and lightning which can affect sensitive assets such as the ancillary equipment and MEPH assets. Extreme precipitation and flooding events can impact upon sensitive assets such as MEPH assets and staff.

11.6.19 **Table 11.11** presents the assessment of vulnerability of the Proposed Development during the operational phase. This takes into account the exposure (based on current and future baseline conditions in **Section 11.5**) and sensitivity taking into account any design, mitigation and enhancement measures in **Section 11.7**). Variables identified as having a 'medium' or 'high' vulnerability are identified as having potential to result in likely significant effects.

Table 11.11 Vulnerability assessment for the operational phase

Receptor	Climate variable	Associated Hazard	Exposure (at 2050s)	Sensitivity	Vulnerability
Power generation asset	Precipitation	Increased frequency, volume and/or duration of extreme precipitation events (flooding).	Low	Moderate	Low – the Site benefits from flood alleviation measures which reduces the exposure from both fluvial and tidal flooding. A new surface water drainage system and associated management and maintenance plan (as described in Chapter 10: Water Environment and Flood Risk) will reduce the exposure to pluvial flooding. The flood risk to the Proposed Development will be assessed in Chapter 10: Water Environment and Flood Risk at the ES stage.
		Decrease in summer rainfall and/or prolonged dry spells, affecting water availability.	Medium	Low	Low – water supply for the Proposed Development will be from the River Dee and no historical water shortage events from drought have been recorded. A site-wide SMC Water Reuse Strategy is being developed to reduce the Site's reliance on water currently abstracted from the River Dee. This will reduce the sensitivity of the assets to drought conditions.
	Temperature	Increase in the frequency and intensity of hot days and	Medium	Low	Low – Gas Turbines (GTs) and Heat Recovery Steam Generators (HRSGs) will be designed to withstand increasing ambient conditions in line with the

Receptor	Climate variable	Associated Hazard	Exposure (at 2050s)	Sensitivity	Vulnerability
		prolonged hot spell events.			Climate Change Adaptation Risk Assessment and Adaptation Plan for the SMC. The proposed development is equipped with hybrid air/ evaporative cooling system enabling unconstrained plant operation during peak temperatures, while reducing water consumption at typical operating conditions.
		Increasing frequency and intensity of hot and dry conditions.	Medium	Low	Low – there is an Emergency Fire Response Plan in place at the SMC, and this includes responses to wildfire.
	Soil Moisture	Changes in soil moisture content coupled with increasing frequency and intensity of hot days.	Medium	Low	Low – the detailed design of the structural foundations and piling will consider ground movement due to changes in soil moisture.
	Humidity	Changes in relative humidity.	Low	Low	Low – during detailed design and procurement, equipment associated with the GT and HRSGs such as kiosks and pumps will be selected to operate in humid environments.
	Storms	Increased intensity of wind and storm events including high winds, lightning, wind-blown rain, dust storms and blizzards.	Medium	Low	Low – weather forecasts are monitored and reviewed to take into account re-programming of operational procedures. All sensitive equipment is designed with lightning protection.

Receptor	Climate variable	Associated Hazard	Exposure (at 2050s)	Sensitivity	Vulnerability
	Sea level	Increased mean sea level and saltwater intrusion.	Low	Moderate	Low – the Site benefits from flood alleviation measures which reduces the exposure from both fluvial and tidal flooding. Chapter 10: Water Environment and Flood Risk will assess the groundwater flood risk to the Proposed Development at the ES stage.
Ancillary equipment and MEPH assets	Precipitation	Increased frequency, volume and/or duration of extreme precipitation events (flooding).	Low	Moderate	Low – the Site benefits from flood alleviation measures which reduces the exposure from both fluvial and tidal flooding. A new drainage system will reduce the exposure to pluvial flooding. Chapter 10: Water Environment and Flood Risk will assess the flood risk to the Proposed Development at the ES stage.
		Decrease in summer rainfall and/or prolonged dry spells, affecting water availability.	Medium	Low	Low – water cooling will comprise a closed-loop system to reuse water and reduce water requirements. Fire suppression water is normally supplied from onsite abstraction wells and back-up water is supplied by abstraction from Manchester Ship Canal. These sources are considered to be resilient to drought conditions.

Receptor	Climate variable	Associated Hazard	Exposure (at 2050s)	Sensitivity	Vulnerability
	Temperature	Increase in the frequency and intensity of hot days and prolonged hot spell events.	Medium	Low	Low – during detailed design and procurement, sensitive equipment such as kiosks will be selected to operate in high temperature environments. Some MEPH assets such as pipework and cabling is underground and therefore not exposed to high temperatures.
		Increasing frequency and intensity of hot and dry conditions.	Medium	Low	
	Soil Moisture	Changes in soil moisture content coupled with increasing frequency and intensity of hot days.	Medium	Low	Low – the detailed design of the below ground equipment such as pipework and cabling will consider ground movement due to changes in soil moisture.
	Humidity	Changes in relative humidity.	Low	Low	Low – during detailed design and procurement, sensitive equipment such as kiosks will be selected to operate in humid environments
	Storms	Increased intensity of wind and storm events including high winds, lightning, wind-blown rain, dust storms and blizzards.	Medium	Low	Low – weather forecasts are monitored and reviewed to take into account re-programming of operational procedures. All sensitive equipment is designed with lightning protection.
	Sea level	Increased mean sea level and saltwater intrusion.	Low	Moderate	Low – the Site benefits from flood alleviation measures which reduces the exposure from both fluvial and tidal flooding. Chapter 10: Water

Receptor	Climate variable	Associated Hazard	Exposure (at 2050s)	Sensitivity	Vulnerability
					Environment and Flood Risk will assess the groundwater flood risk to the Proposed Development at the ES stage.
Site staff	Precipitation	Increased frequency, volume and/or duration of extreme precipitation events (flooding).	Low	Low	Low – weather forecasts are monitored and reviewed to take into account re-programming of operational procedures.
		Decrease in summer rainfall and/or prolonged dry spells, affecting water availability.	Medium	Low	Low – receptor is less sensitive to droughts.
	Temperature	Increase in the frequency and intensity of hot days and prolonged hot spell events.	Low	High	Low – weather forecasts are monitored and reviewed to take into account re-programming of staff as part of operational procedures.
		Increasing frequency and intensity of hot and dry conditions.	Low	High	Low – weather forecasts are monitored and reviewed to take into account re-programming of staff as part of operational procedures.
	Soil moisture	Changes in soil moisture content coupled with increasing frequency and intensity of hot days.	Medium	Low	Low – receptor is of low sensitivity to changes in soil moisture.

Receptor	Climate variable	Associated Hazard	Exposure (at 2050s)	Sensitivity	Vulnerability
	Humidity	Changes in relative humidity.	Low	Moderate	Low – weather forecasts are monitored and reviewed to take into account re-programming of staff as part of operational procedures.
	Storms	Increased intensity of wind and storm events including high winds, lightning, wind-blown rain, dust storms and blizzards.	Low	High	Low – weather forecasts are monitored and reviewed to take into account re-programming of staff as part of operational procedures.
	Sea level	Increased mean sea level and saltwater intrusion.	Low	Low	Low – receptor is of low sensitivity to changes to sea level.

- 11.6.20 The results of the vulnerability assessment for operational phase show that ‘low’ vulnerability has been identified for all climate variables. The mitigating measures in the existing SMC site-wide Climate Change Risk Assessment and Adaptation Plan, and design commitments of the Proposed Development assets support measures to manage the risks from weather-related events and reduce the sensitivity of the receptors to the climate variables. As stated above, variables with a ‘low’ vulnerability are not anticipated to result in any likely significant effects. Therefore, no likely significant effects are identified in the construction phase.

Scope

- 11.6.21 The vulnerability assessment in **Table 11.10** and **Table 11.11** have demonstrated that the Proposed Development is of low vulnerability to climate change trends across the asset lifecycle and therefore Climate Resilience has been scoped out of further assessment.

Table 11.12 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Climate Resilience	Construction	✗	✓	Output from the vulnerability assessment is Low for all climate variable and receptor combinations
Climate Resilience	Operational	✗	✓	Output from the vulnerability assessment is Low for all climate variable and receptor combinations

11.7 Mitigation Measures

- 11.7.1 Embedded mitigation measures have been identified and are proposed to be adopted as part of the evolution of the design (embedded into the Proposed Development design). These measures typically include those that have been identified as good or standard practice and include actions that would be undertaken to meet existing legislation and regulatory requirements.
- 11.7.2 As there is a commitment to implementing these environmental measures, and also to various standard sectoral practices and procedures. These are considered

inherently part of the design of the Proposed Development and have, therefore, been considered in the Scoping assessment.

- 11.7.3 Specific embedded mitigation measures relevant to Climate Resilience are listed in **Table 11.13**. Embedded mitigation measures related to flood risk and surface water can be found in **Chapter 10: Water Environment and Flood Risk**.

Table 11.13 Embedded mitigation measures relevant to Climate Resilience

Mitigation Measures embedded into the Proposed Development design	How the measure will be secured
Construction	
The Outline CoCP and subsequent iterations will include measures to manage and mitigate weather related hazards during the construction phase, in line with good practice, construction design and management and health and safety requirements.	Inclusion within the Outline CoCP.
Operational	
The operation of the Stanlow Manufacturing Complex (SMC) is managed by a site-wide Climate Change Risk Assessment and Adaptation Plan (WSP, 2024). Once the Proposed Development is operational, it will be subject to the adaptation measures within the plan. Applicable measures from the site-wide Climate Change Risk Assessment and Adaptation Plan have been incorporated into this assessment and detailed in Table 11.11.	Environment Agency permitting and regulatory requirements.

11.8 Assumptions and Limitations

- 11.8.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:
- Climate change, by its very nature, is associated with a range of assumptions and limitations through uncertainty in climate models regarding how global climatic trends will be reflected at the regional scale. The UKCP18 projections have been used to infer future changes in a range of climate variables that may affect the vulnerability of the Project to climate change. At the time of writing, these represent the most up-to-date representation of future climate in the UK. The Climate Risk Indicator (CRI) has been developed using UKCP18 projections.
 - There are inherent uncertainties associated with climate projections, and they are not predictions of the future. It is possible that the future climate will differ from the future climate against which the Project has been assessed, depending on global emissions over the next century. A 'high' emissions

scenario (RCP 8.5) across short, and medium term time frames (in line with the construction and operational phase of the Proposed Development) have been used to develop a baseline against which climate change risk has been assessed. Data for the 10th, 50th and 90th percentiles for the high emissions scenario (RCP8.5) have been used in the assessment to highlight uncertainty and ensure a conservative assessment of risk.

- Any further research, analysis or decision-making should take account of the accuracies and uncertainties associated with climate projections. It is also important to note that the analysis is based on selected observational data, the results of climate model ensembles and a selected range of existing climate change research and literature available at the time of assessment. Any future decision-making based on this analysis should consider the range of literature, evidence and research available at that time and any changes to this.
- The Proposed Development will be incorporated into the site-wide management of climate risk, which SMC manages as part of its Environment Agency permitting and regulatory requirements. This Climate Resilience assessment for the Proposed Development draws on information gathered as part of the Phase 1 CHP development, and the existing site-wide Climate Change Risk Assessment and Adaptation Plan to identify measures to mitigate climate change.

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EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 12: Greenhouse Gases

02-09-2026

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12. Greenhouse Gases

12.1 Introduction

- 12.1.1 This chapter considers the potential impacts of the Proposed Development on greenhouse gases during the construction and operational phases. It sets out the proposed methodology for the greenhouse gases assessment and identifies impacts that can be scoped out of the Environmental Impact Assessment (EIA).
- 12.1.2 The requirement to consider a project's impact on, and vulnerability to, climate change results from Schedule 4 of the EIA Regulations (2017). The EIA Regulations require:
- “A description of the likely significant effects of the development on the environment resulting from... 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”.*
- 12.1.3 As such this chapter considers the impacts and effects of the Proposed Development in terms of its contribution to climate change, via a Greenhouse Gases (GHG) emissions assessment. The consideration for the vulnerability of the Proposed Development to climate change is addressed in **Chapter 11: Climate Resilience**.
- 12.1.4 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.

12.2 Consultation and Engagement

- 12.2.1 Engagement undertaken for the Combined Heat and Power (CHP) Phase 1 Town and Country Planning Application (TCPA) is summarised in **Table 12.1**. CHP Phase 1 comprises a Town and Country Planning Act (TCPA) regime application, with determination anticipated later in 2026. The engagement undertaken on Phase 1 to date is relevant to the Scoping of the Proposed Development as it has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the Proposed Development.
- 12.2.2 Feedback in the Proposed Development Scoping Opinion will inform the production of the Environmental Statement (ES) for the Proposed Development.

Table 12.1 Consultation and engagement to date

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
Cheshire West and Chester Council (CWCC)	24 January 2025	Summary of EIA Scoping Opinion (24/03305/SCO) in relation to GHG – agreement on the Applicant’s proposed elements to scope out: • Disposal of Construction Waste (A5) (Construction). • Land Use, Land Use Change and Forestry (A5) (Construction). • Operation (B1). • Land Use, Land Use Change and Forestry (B8) (Operation).
CWCC Council	12 February 2026	On-line Teams call with CWCC Council, Applicant and WSP: • WSP briefed the CWCC climate change team regarding the GHG assessment approach and key findings for Phase 1. • Applicant highlighted the operational dependency of Phase 1 on the planned Hydrogen Production Plant (HPP), being progressed by the Applicant under a separate planning application. • CWCC Council sought to understand potential implications for the GHG assessment for Phase 1 if the proposed CHP facility progressed without the HPP.
CWCC Council	19 March 2026	On-line Teams call with CWCC Council, Applicant and WSP: • CWCC Council requested that a ‘Without hydrogen available’ scenario is presented as a core case for GHG assessment for Phase 1 ES. • It was agreed that the Applicant would provide an updated GHG assessment for the Phase 1 ES, presenting a ‘Without Hydrogen available’ scenario as a core case and ‘With Hydrogen available’ as a sensitivity case (to reflect the dependence of Phase 1 on the planned HPP).

12.3 Guidance

12.3.1 This chapter has, and when undertaken the assessment will give consideration to the following guidance:

- Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management & Assessment (IEMA)): Assessing greenhouse gas emissions and evaluating their significance with supplementary guidance (Edition 2.1) (ISEP, 2026);
- British Standards Institution (BSI), Sustainability of construction works, Sustainability assessment of civil engineering works, Calculation methods (BS EN 17472:2022), 2022 (BSI, 2022);
- National Planning Practice Guidance 2024 (MHCLG & DLUHC, 2024);
- The Greenhouse Gas (GHG) Protocol (2015) (GHG Protocol, n.d.);
- PAS 2080:2023 Carbon Management in Buildings and Infrastructure (BSI, 2023); and
- Royal Institution of Chartered Surveyors (RICS), Whole Life Carbon Assessment for the Built Environment 2023 (RICS, 2023).

12.4 Study Area

12.4.1 The assessment of GHG emissions is not restricted by geographical area, instead focussing on any increase or decrease in emissions as a result of the Proposed Development, wherever that may be. This includes:

- Construction emissions from the Proposed Development and demolition of existing infrastructure but also relating to the manufacture and transport of materials to and from the Site and their manufacture. This may be distant from the Proposed Development location, for example, GHG emissions associated with the manufacture of concrete and steel in terms of embodied carbon and energy in the production process – direct GHG emissions.
- Operation emissions (increase or reduction) that result from the operation of the Proposed Development and any shifts in energy usage that may occur. In this case, GHG emissions include those for embodied emissions arising from materials and waste for the operation of the Proposed Development, operational energy usage and water usage – indirect GHG emissions.

12.5 Baseline Conditions

12.5.1 In the baseline, GHG emissions occur constantly and widely as a result of natural and human activity, including land use and land use change, energy consumption (e.g. fossil fuels, purchased energy from the grid and/or other sources) and industrial processes. The GHG emissions assessment would only consider the scenario in which the Proposed Development results in additional or avoided emissions in comparison to the baseline. The baseline conditions therefore focus on those sources of emissions subject to change between the baseline and the Proposed Development.

Existing Baseline

12.5.2 The baseline involves no construction activities and therefore the construction baseline is zero emissions. In terms of operational emissions, the GHG baseline will be established by identifying existing GHG emissions sources within the Site, assuming that the Proposed Development does not progress. The baseline for the GHG assessment will include the GHG emissions associated with any operational emissions from existing infrastructure. Where data is available this will be used to quantify carbon emissions. Where data is unavailable, benchmarks, estimates, or approximations will be used based on professional judgement. It is noted that the existing CHP facility will be partially replaced by the construction and operation of Phase 1.

12.5.3 The latest summary of GHG emissions for 2023 for Cheshire West and Chester and the UK are presented in **Table 12.2** (Department for Energy Security & Net Zero, 2025). The emissions sources are a subset of the total emissions for each region, chosen for their relevance to the Proposed Development, with the grand total for all emissions sources provided. These emissions have only been provided for context and are not the baseline emissions for this assessment.

Table 12.2 Emissions sources (2023) for Cheshire West and Chester and the UK

Emissions Sources	Cheshire West and Chester (ktCO _{2e})	UK (ktCO _{2e})
Industry Electricity	69	8,959
Industry Gas	72	12,571
Large Industrial Installations	739	24,931
Industry 'Other	198	10,214
Industry Total	1,079	56,675
Commercial Electricity	113	15,762

Emissions Sources	Cheshire West and Chester (ktCO ₂ e)	UK (ktCO ₂ e)
Commercial Gas	59	11,270
Commercial 'Other'	15	2,559
Commercial Total	188	29,590
Public Sector Electricity	13	3,003
Public Sector Gas	26	6,151
Public Sector 'Other'	6	1,225
Public Sector Total	46	10,380
Domestic Electricity	95	17,625
Domestic Gas	291	50,657
Domestic 'Other'	47	8,615
Domestic Total	432	76,897
Road Transport (A Roads)	304	43,809
Road Transport (Motorways)	266	23,588
Road Transport (Minor Roads)	177	40,977
Diesel Railways	12	1,703
Transport 'Other'	57	3,230
Transport Total	816	113,307
Landfill	316	14,450
Waste Management 'Other'	134	5,388
Waste Management Total	450	19,838
Other Total.(LULUCF and agriculture)	430	49,407
Grand Total	3,441	356,094
*Note: individual emission entries have been rounded, so rounding errors may occur in combined totals.		

Sensitive Receptors

- 12.5.4 The impacts of GHG emissions relate to their contribution to global warming and climate change. These impacts are global and cumulative in nature, with every tonne of GHG emissions contributing to impacts on natural and human systems. GHG emissions result in the same global effects wherever and whenever they

occur and, therefore, the sensitivity of different human and natural receptors is not considered.

Future Baseline

- 12.5.5 As noted in **Chapter 1: Introduction**, it is assumed that CHP Phase 1 would be operational by the commencement of the Proposed Development. For the future baseline, without the Proposed Development, it is assumed that CHP Phase 1 will be operational and the GHG assessment will consider emissions without any further development of the Site beyond CHP Phase 1.
- 12.5.6 It is assumed that without the Proposed Development, CHP Phase 1 would operate at its planned capacity using a combination of refinery fuel gas and natural gas as specified for the core case assessed in the TCPA application and three of the Multi-Fuel Fired Boilers from the existing CHP facility would continue to operate using a fossil fuel mix at part load.
- 12.5.7 The sensitive receptor for the GHG assessment is the global climate, therefore consideration of impacts related to future climate change is inherent in the assessment.

12.6 Description of Likely Significant Effects

Construction Phase

- 12.6.1 In accordance with the BS EN 17472:2022 lifecycle stages for carbon management in buildings and infrastructure, the possible likely significant effects associated with the construction phase include those elements set out in **Table 12.3**.

Table 12.3 Key sources of potential emissions in construction phase

Lifecycle Stage Impacts (with codes as per BS EN 17472:2022)	Potential Sources of Emissions (Not Exhaustive)
Product Stage (manufacture and transport of raw materials to suppliers) (A1-3)	Embodied emissions associated with extraction and manufacturing of the required raw materials.
Transport of Materials to Site (A4)	Emissions from fuel and electricity used in vehicles transporting materials to Site.
Plant and Equipment Use during Construction (A5)	Emissions from fuel and electricity used in plant and equipment on the Site.

Lifecycle Stage Impacts (with codes as per BS EN 17472:2022)	Potential Sources of Emissions (Not Exhaustive)
Transport of Construction Waste (A5)	Emissions from fuel/energy used in vehicles transporting waste materials from construction, demolition of existing infrastructure and excavation, to destinations away from the Site.
Disposal of Construction Waste (A5)	GHG emissions released during treatment and disposal of construction waste arisings.
Land use, land use change and forestry (A5)	Change in emissions associated with the clearance and disposal of vegetation during construction of the Proposed Development.

Operational Phase

12.6.2 In relation to the BS EN 17472:2022 lifecycle stages, the possible likely significant effects associated with the operational phase include those elements set out in **Table 12.4**.

Table 12.4 Key sources of potential emissions in operational phase

Lifecycle Stage Impacts (with codes as per BS EN 17472:2022)	Potential Sources of Emissions (Not Exhaustive)
Operation (B1)	Emissions attributable to the use of products and materials (such as the use of refrigerants if applicable) over the lifecycle of the Proposed Development.
Maintenance, Repair, Replacement, Refurbishment (B2-5)	Embodied emissions associated with maintenance, repair, replacement and refurbishment of equipment and infrastructure for operation of the Proposed Development, and related emissions from use of plant.
Operational Energy Use (B6)	Emissions from the use of energy for the Proposed Development (e.g. grid/network energy supplies for heating and cooling in ancillary buildings, lighting, fuel for backup generators and fuel for site vehicles).
Operational Water Use (B7)	Emissions from the use of water for the Proposed Development (e.g. process operations, cleaning and maintenance activities).
Land use, land use change and forestry (B8)	Change in emissions associated with the release of carbon dioxide or carbon sequestration associated with a change in land use during operation of the Proposed Development.

Lifecycle Stage Impacts (with codes as per BS EN 17472:2022)	Potential Sources of Emissions (Not Exhaustive)
Other Operational Processes (B8)	Embodied emissions associated with use of process consumables for the Proposed Development (e.g. for Demineralisation Plant chemicals, Steam Generator dosing).
Benefits beyond system boundary (D1)	Emissions associated with the usage of Proposed Development is expected to reduce emissions associated with the supply of steam and electricity through the use of more efficient equipment.

Scope

12.6.3 A summary of the proposed scope for the GHG construction and operational phase assessments is presented in **Table 12.5**.

Table 12.5 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Product Stage (manufacture and transport of raw materials to suppliers) (A1-3)	Construction	✓		Raw materials required for Proposed Development would result in embodied emissions that have the potential to have material impacts.
Transport of Materials to Site (A4)	Construction	✓		Construction phase emissions from fuel/energy consumption due to the delivery of material to Site have the potential to be significant.
Plant and Equipment Use during Construction (A5)	Construction	✓		Emissions from plant and equipment used during construction of the Proposed Development have the potential to be significant.
Transport of Construction Waste (A5)	Construction	✓		Emissions from fuel/energy consumption associated with the transport of waste arisings may have potential material impacts.
Disposal of Construction Waste (A5)	Construction		✓	Emissions from the disposal and degradation of waste materials are expected to be minimal as they will predominantly comprise inert waste from excavation or surplus concrete and recyclable materials.

Element	Phase	Scoped In	Scoped Out	Justification
				This element is therefore scoped out of the assessment.
Land use, land use change and forestry (A5)	Construction		✓	A review of the Proposed Development location indicates that the majority of the Site consists of already developed land with no change to the capacity for carbon sequestration from a change in land use. The potential for the Proposed Development to extend into existing natural habitat is limited and if taken forward, it is expected this would be mitigated by the provision of equivalent replacement habitat, with no significant change or impact in terms of GHG emissions. As a result this element is scoped out of the assessment.
Operation (B1)	Operational		✓	The Proposed Development is not expected to make extensive use of materials that would release GHG emissions, so this element is scoped out of the assessment.
Maintenance, Repair, Replacement, Refurbishment (B2-5)	Operational	✓		The Proposed Development will require scheduled maintenance and refurbishment activities requiring replacement parts, with the potential for material impacts from embodied carbon and use of equipment.
Operational Energy Use (B6)	Operational	✓		Emissions attributable to the use of grid electricity and the potential use of other fuel supplies, for steam and electricity production during scheduled maintenance.
Operational Water Use (B7)	Operational	✓		It is expected that process water would be required for operation of the Proposed Development, with the potential for material impacts.
Land use, land use change and forestry (B8)	Operational		✓	A review of the Proposed Development location indicates that the majority of the Site consists of already developed land

Element	Phase	Scoped In	Scoped Out	Justification
				with no change to the capacity for carbon sequestration from a change in land use. The potential for the Proposed Development to extend into existing natural habitat is limited and if taken forward, it is expected this would be mitigated by the provision of equivalent replacement habitat, with no significant change or impact in terms of GHG emissions. As a result this element is scoped out of the assessment.
Other Operational Processes (B8)	Operational	✓		Process chemicals would be required in the Hydrogen-Ready Steam Generator (HRSG) and for managing water quality, which would result in embodied GHG emissions that have the potential to be significant over the operational life of the Proposed Development.
Benefits beyond system boundary (D1)	Operational	✓		A reduction in emissions associated with improved efficiency for the generation of steam and electricity in the Proposed Development, has the potential for significant beneficial impacts.

12.7 Mitigation Measures

12.7.1 In line with ISEP guidance (ISEP, 2026), it is important to incorporate measures to reduce GHG emissions at an early stage. This means that mitigation should be considered at all stages of design, not just as part of the EIA process. The sections below outline likely proposed GHG reduction measures for construction and operation of the Proposed Development.

Construction Phase

12.7.2 Ongoing design work is actively considering a range of design mitigation measures. . Relevant additional design, mitigation and enhancement measures will be identified in the ES, which may include:

- Early-stage design and specification for construction of the Proposed Development with a view to minimising future GHG emissions, using the PAS 2080:2023 standard for carbon management in buildings and infrastructure (BSI, 2023) as a basis for design optimisation, with consideration of the carbon reduction hierarchy during design and construction:
 - Avoid: aligning the outcomes of the Proposed Development and/or programme of work with the net zero transition at the system level and evaluate the basic need at the asset and/or network level;
 - Switch: assess alternative solutions and then adopt one that reduces whole life emissions through alternative scope, design approach, materials, technologies for operational carbon reduction, among others, while satisfying the whole life performance requirements; and
 - Improve: identify and adopt solutions and techniques that improve the use of resources and design life of an asset/network, including applying circular economy principles to assess materials/products in terms of their potential for reuse or recycling after end of life.
- Maximising the opportunity to use more sustainable materials by identifying in procurement documentation, that materials and products with reduced embodied carbon emissions, and materials/resources featuring recycled content are preferred (where safe and of sufficient integrity for engineering).
- Designing, specifying and constructing the Proposed Development with a view to maximising the operational lifespan and minimising the need for maintenance and refurbishment (and thus reducing the frequency of releasing associated GHG emissions).
- Specifying efficient mechanical and electrical equipment (such as pumps, motors and lighting) that is long-lasting and chosen for its durability and energy efficiency credentials.
- Using locally sourced materials where available and practicable to minimise the distance materials are transported from source to Site.
- Using more modern and efficient construction plant and delivery vehicles, and/or those powered by lower carbon fuels or electricity.

Operational Phase

- 12.7.3 The scheme has been conceptualised as part of a decarbonisation roadmap for SMC and the wider area. The CHP will exploit the cogeneration of industrial high temperature heat, along with power, in order to substantially increase efficiency in comparison to current fossil fuel generation plant. The 100% hydrogen ready gas turbines and HRSGs are designed for hydrogen firing as soon as hydrogen

becomes available, from schemes such as HPP2 without needing major retrofit or investment. The efficiency of steam and power generation will be greater than the boilers being replaced.

12.7.4 Relevant additional design, mitigation and enhancement measures will be identified in the ES, which may include:

- Maximising the operational effectiveness (fuel sources, steam and power generation) and minimising the parasitic load;
- Establish effective systems for energy monitoring and sub-metering for key components of the Proposed Development for optimisation of operational conditions;
- Maximising the operational lifespan and minimising the need for maintenance and refurbishment (and all associated emissions);
- Maximising the potential for reuse and recycling of materials/elements at the end-of-life stage; and
- Operating, maintaining and refurbishing the Proposed Development using energy efficient equipment.

12.8 Assessment Methodology

12.8.1 The assessment approach considers the likely magnitude of GHG emissions (or avoided emissions) in comparison to the baseline without the Proposed Development. It considers emissions throughout the lifecycle of the Proposed Development addressing:

- Construction phase - e.g. embodied emissions associated with materials, transportation of materials to site and waste/arising from the Site, and the construction process; and
- Operational phase - e.g. process operations and use of energy for ancillary facilities, lighting and controls, as well as avoided emissions from the Proposed Development.

12.8.2 It is noted that there is intended to be operational connectivity between the Proposed Development and future planned HPPs, which have consent and are being progressed by the Applicant. However, in order to assess a reasonable worst case for GHG impacts the assessment will consider the case where operation of the Proposed Development is not linked to the future planned HPPs and hydrogen is not available for use a fuel in the CHP facility. For the operational phase it is assumed that both CHP Phase 1 and the Proposed Development would use a combination of refinery fuel gas and natural gas for its operation. This is consistent with the approach used for the GHG assessment carried out for the

TCPA application for CHP Phase 1. This working assumption will be informed by the design for the Proposed Development at the ES stage and clearly highlighted.

- 12.8.3 For all BS EN 17472:2022 lifecycle stages and sub-stages of the Proposed Development, the assessment will include the following:
- Collection of available data/information on the scale of GHG emitting activities (e.g. tonnes concrete, litres of fuel, kWh electricity) and GHG emitting activities for the baseline and for the Proposed Development. In each case this will cover the whole study period (minimum design life of 25 years).
 - Calculation of the GHG emissions by applying a suitable emissions factor (per unit of emissions generating or avoidance activity).
- 12.8.4 Emissions calculations will focus on emissions annually and throughout the Proposed Development lifecycle. Values will be reported as tonnes of CO₂ equivalents (tCO₂e).

Significance Criteria

- 12.8.5 The methodology adopted will attribute a significance of effect level based on the sensitivity/value of the affected receptor(s) and the magnitude of change arising from the Proposed Development. Any magnitude of emitted or avoided GHG emissions makes a cumulative contribution to climate change. As there is only one receptor 'the climate', it has a consistent sensitivity (**high**) no matter the location of the emissions source.
- 12.8.6 Significance of GHG impacts is assessed in line with ISEP guidance (ISEP, 2026): *"a development's emissions should be based on its net impact over its lifetime, which may be adverse, beneficial or negligible"*. The evaluation of significance is not solely based on the magnitude of GHG emissions but whether the Proposed Development contributes to reducing GHG emissions relative to a comparable baseline consistent with achieving net zero by 2050.
- 12.8.7 With regards to assigning significance, ISEP guidance (ISEP, 2026) provides five distinct levels of significance as outlined below. Major or moderate adverse effects and beneficial effects are considered significant; minor adverse and negligible effects are considered to be not significant.
- **Major adverse (significant):** the Proposed Development's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.

- **Moderate adverse (significant):** the Proposed Development's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.
- **Minor adverse (not significant):** the Proposed Development's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
- **Negligible (not significant):** the Proposed Development's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.
- **Beneficial (significant):** the Proposed Development's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

12.8.8 In order to provide context to the GHG emissions, and as set out in the ISEP guidance (ISEP, 2026), the estimated GHG emissions arising from the Proposed Development will be compared with the respective UK carbon budgets (UK Government, 2023), shown in **Table 12.6**, which have been set by the UK Government. This includes the Carbon Budget Order 2026, which came into effect on 26 June 2026, covering the years 2038 to 2042.

Table 12.6 UK carbon budgets

Carbon Budget Period	UK Carbon Budget (MtCO _{2e})
Fourth: 2023-2027	1,950
Fifth: 2028-2032	1,752
Sixth: 2033-2037	965
Seventh: 2038-2042	535

In-Combination Climate Impacts

- 12.8.9 An In-combination Climate Impacts (ICCI) assessment is undertaken by assessing how the receptors in the surrounding environment identified through the assessments of the other topic chapters are affected by future climate parameters, informed by the future climate baseline. The sensitive receptor for GHG emissions is the global climate; therefore an ICCI assessment is not considered as part of the GHG assessment as the effects of climate change on the receptor (climate) are an inherent aspect of the GHG assessment.
- 12.8.10 ICCI assessments will be included within individual topic Chapters, based on professional judgement against the latest UK climate forecast data.

12.9 Assumptions and Limitations

- 12.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:
- The assessment will assume that there will be no change in the operation of the existing CHP facility for the existing baseline.
 - The assessment will assume that CHP Phase 1 would be operational for the future baseline and that retained elements of the existing CHP facility would continue to operate alongside CHP Phase 1 in the absence of the Proposed Development.
 - The assessment will assume that refinery fuel gas and natural gas will be used for operation of CHP Phase 1 and the Proposed Development, based on a fuel mix to be specified at the ES stage.
 - The assessment will address impacts arising from GHG emissions (beneficial and/or adverse) associated with the Proposed Development.

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EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 13: Socio-economics**

02-09-2026

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13. Socio-economics

13.1 Introduction

- 13.1.1 This chapter considers the potential impacts of the Proposed Development on socio-economics during the construction, operational and decommissioning phases. It sets out the proposed methodology for the socio-economics assessment and identifies impacts that can be scoped out of the Environmental Impact Assessment (EIA).
- 13.1.2 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.
- 13.1.3 The socio-economic assessment scope will include construction and operational phase employment generation and demand for temporary accommodation from construction workers. This scope differs from the assessment of population and human health (as outlined in **Chapter 14: Population and Human Health**), which focuses on the benefit/inconvenience or advantage/disadvantage to a population or user group, and how the construction or operation of the Proposed Development affects their ability to undertake certain activities or facilitates or provides opportunity for them to undertake certain activities.

13.2 Consultation and Engagement

- 13.2.1 There has been no specific consultation carried out in relation to socio-economics at the time of writing.
- 13.2.2 However, consultation was undertaken for Combined Heat and Power (CHP) Phase. CHP Phase 1 is a Town and Country Planning Act regime application with determination anticipated later in 2026. This is relevant because the consultation undertaken on CHP Phase 1 has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the Proposed Development.
- 13.2.3 The Proposed Development EIA Scoping Opinion will inform the content and production of the Environmental Statement (ES).

13.3 Guidance

- 13.3.1 This chapter and the subsequent assessment will consider the following guidance:
- Homes and Communities Agency (HCA) Employment Density Guide 3rd Edition (Homes and Communities Agency, 2015);

- HCA Additionality Guide 4th Edition (Homes and Communities Agency, 2014); and
- Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management & Assessment (IEMA)) Guidance - Delivering Proportionate EIA (ISEP, 2017).

13.4 Study Area

- 13.4.1 The Study Area for the assessment will vary according to receptor, as outlined below in **Paragraphs 13.4.3 and 13.4.5**. In the absence of statutory guidance on socio-economic assessments, reference has been made to best practice guidance and professional judgement/experience.
- 13.4.2 For the purposes of the socio-economics assessment, a broad 'Local' Study Area has been defined as Cheshire West and Chester, the 'Regional' Study Area encompasses north west England (the 'north west') and the 'National' Study Area has been defined as Great Britain. Those socio-economic receptors for which some specific geographical parameters can be applied in relation to the Proposed Development are outlined below.

Employment Generation

- 13.4.3 The employment generation of the Proposed Development is considered relative to the north west, as this represents the principal labour market catchment area (the 'Regional Study Area'). Cheshire West and Chester are accessible from all areas of the north west and is likely to be served by labour from the wider region rather than just restricted to the local labour market, particularly given the nature of the Proposed Development and the growth of the wider renewable energy market in the locality. The north west labour market incorporates the population that may reasonably be expected to travel to and benefit from employment associated with the Proposed Development. The Study Area for employment generation follows best practice guidance set out within the HCA Employment Density Guide 3rd Edition (Homes and Communities Agency, 2015) and the HCA Additionality Guide 4th Edition (Homes and Communities Agency, 2014).

Increased Demand for Accommodation from Temporary Workers

- 13.4.4 Any workers employed at the Site during the construction phase are likely to require access to local accommodation, should they be drawn from outside of the region. This may be due to the requirement for a specialist construction skill or activity for which there is no local workforce availability. Whilst no temporary worker overnight accommodation is proposed, consideration of the potential requirement for use of local accommodation providers by some construction

workers has been undertaken in order to present a 'worst case scenario' for assessment. Approximately 50-150 construction workers will be employed increasing to 300 at the peak of construction with an assumption that 80% of the workforce will commute from home and 20% will require local hotel accommodation. However, assumptions surrounding the exact number of workers who may require temporary accommodation will be confirmed as part of the ES.

- 13.4.5 Given that any workers who are temporarily relocating to the local area during construction are likely to reside within the locality, the surrounding settlements within an approximately 5km radius from the Site will be considered. In addition to this, Ellesmere Port and the city of Chester (3.5km to the northwest and 5.7km to the south respectively) are also relevant for consideration, given that these are larger settlements that offer a range of amenities including temporary accommodation, hotels, and other services. The extent of the Study Area for temporary accommodation has been determined based on professional judgement and is deemed appropriate to capture the receptors most likely to be affected by the Proposed Development. It is acknowledged that there are numerous temporary accommodations within the wider local area in Runcorn, Warrington, and Liverpool that may also serve construction workers.

13.5 Baseline Conditions

- 13.5.1 A review of available information to determine the baseline conditions in the relevant Local and Regional Study Areas (outlined in **Section 13.4** above) has been undertaken.
- 13.5.2 The desk-based review has been undertaken using the publicly available data sources outlined in **Table 13.1**.

Table 13.1 Key sources of socio-economic data

Source	Date Accessed	Summary	Coverage of Study Area
Nomis Labour Market Profiles (Office for National Statistics, 2026)	29 April 2026	This profile brings together labour market data on population, economy, and employment.	Local, regional and national.
Index of Multiple Deprivation (Ministry of Housing, Communities & Local Government, 2025)	29 April 2026	The Index of Multiple Deprivation identifies small area measures of relative deprivation across England.	Local and regional.

Existing Baseline

Population

- 13.5.3 The 2024 population estimate for Cheshire West and Chester was 371,652 residents, compared with 7,737,414 residents in the north west of England. The estimated working age population (aged 16-64) as a percentage of the total resident population in the Cheshire West and Chester, the north west, and Great Britain is shown in **Table 13.2**. The proportion of the working age population is broadly similar across all three geographies.

Table 13.2 Population aged 16-64 (% of the resident population)

Cheshire West and Chester	North West	Great Britain
61.4	62.6	62.8

Economy and Employment

- 13.5.4 The Nomis Job Densities Report (Office for National Statistics, 2026) is available on a local authority-wide and sub-regional level and indicates the availability of employment and labour demand. The 2024 job density levels in Cheshire West and Chester (i.e. the ratio of total jobs to the working age population) indicates that there are 0.86 jobs available for each working age resident in the borough. This is broadly in line with levels in the north west and Great Britain as a whole, as outlined in **Table 13.3**.

Table 13.3 Job density rates (number of jobs per working age resident)

Cheshire West and Chester	North West	Great Britain
0.86	0.82	0.85

- 13.5.5 **Table 13.4** details the qualifications of the resident working age population (aged 16-64) in 2025. Across most levels of educational attainment, Cheshire West and Chester performs better than the regional and national level. In particular, 52.9% of the local authority population have achieved degree level (equivalent to Registered Qualification Framework (RQF) 4 and above) compared to 45.7% for the north west and 48.6% for Great Britain.

Table 13.4 Qualifications of resident population aged 16-64 (Jan 2025-Dec 2025)

Qualifications	Cheshire West and Chester (%)	North West (%)	Great Britain (%)
RQF4 and above	52.9	45.7	48.6
RQF3 and above	75.3	66.5	69.0
RQF2 and above	92.5	86.1	87.0
RQF1 and above	95.2	88.7	89.3
Other qualifications	N/A	3.6	4.4
No qualifications	3.6	7.7	6.3

Note: data for qualifications is measured using the RQF which incorporates data for vocational and trade occupations, as well as National Vocational Qualification (NVQ) levels. RQF2 is equivalent to 4-5 GCSE grades A*-C, or an intermediate NVQ. RVQ4 and above is equivalent to a degree level qualification or Higher National Diploma.

13.5.6 **Table 13.5** shows a breakdown of the proportion of employee jobs in Cheshire West and Chester the north west and Great Britain. There is a broadly similar breakdown of full time and part time jobs across all geographies, with a slightly lowered proportion of the Cheshire West and Chester population in full time work as compared to the regional and national figures.

Table 13.5 Proportion of employee jobs (2024)

Employee Jobs	Cheshire West and Chester (%)	North West (%)	Great Britain (%)
Full time	66.9	69.3	69.2
Part time	33.1	30.7	30.8

13.5.7 **Table 13.6** shows the proportion of total employees working in each industry sector in 2024. Broad similarities in industry concentration can be identified across the Local and Regional Study Areas when compared to the national concentrations. For example, employment in the construction sector accounts for between 4.6-5.0% of jobs, and in the professional, scientific, and technical sector for between 9.3-10.9% of jobs. Differences are visible in the human health and social work activities sector however, with 12% of the Cheshire West and Chester population working in the sector compared to 15.9% for the north west. Similarly, employment in the financial and insurance industries is almost twice as high in Cheshire West and Chester at 4.6% compared to only 2.4% for the north west.

Table 13.6 Overview of jobs by industry sector 2024

Industry	Cheshire West and Chester (%)	North West (%)	Great Britain (%)
B: Mining and Quarrying	0.1	0.1	0.2
C: Manufacturing	8.0	8.7	7.3
D: Electricity, gas, steam and air conditioning supply	0.4	0.4	0.4
E: Water supply; sewerage, waste management and remediation activities	0.7	0.7	0.7
F: Construction	4.6	4.9	5.0
G: Wholesale and retail trade; repair of motor vehicles and motorcycles	14.3	14.0	13.7
H: Transportation and storage	3.4	4.7	5.0
I: Accommodation and food service activities	9.7	7.5	7.8
J: Information and communication	2.3	3.0	4.5
K: Financial and insurance activities	4.6	2.4	3.4
L: Real estate activities	2.0	1.9	1.9
M: Professional, scientific and technical activities	10.9	9.6	9.3
N: Administrative and support service activities	10.3	8.7	8.6
O: Public administration and defence; compulsory social security	4.0	5.1	4.9
P: Education	8.0	8.3	8.6
Q: Human health and social work activities	12.0	15.9	14.2
R: Arts, Entertainment and Recreation	3.4	2.3	2.5
S: Other service activities	1.4	1.6	1.9

Deprivation

- 13.5.8 The English Indices of Multiple Deprivation (IMD) uses a combination of information relating to seven 'domains' to create an overall score of deprivation. These are income; employment; health deprivation and disability; education, skills and training; barriers to housing and services; crime; and living environment.
- 13.5.9 Deprivation is scored between 1 and 33,755 (representing the 33,755 lower layer super output areas (LSOAs) within England), with a score of 1 being most deprived and 33,755 being least deprived (Ministry of Housing, Communities & Local Government, 2025).
- 13.5.10 The IMD (2025) (the most recently published) ranks the deprivation of Cheshire West and Chester Council (CWCC) as less deprived overall than 63% of local authority districts in England. Within this area, the highest ranking category in terms of deprivation is 'Health and Disability' and the lowest ranking category is 'Barriers to housing and services'.

Local Employment Context

- 13.5.11 The Proposed Development Site (the area within the Site application boundary) comprises woodland, agricultural land, brownfield and former designated employment land, which is currently owned by the Applicant for fuel production and storage purposes. The Site is deemed suitable for development of the Proposed Development due to its previous uses and the surrounding local employment context (existing industrial facilities) with the Proposed Development aligning with the surrounding business uses.

Local Accommodation Context

- 13.5.12 There is a considerable range of accommodation types and providers within the surrounding 5km Study Area, with several hotel chains and smaller bed and breakfasts and guest houses located within Ellesmere Port. To the south of Stanlow, Chester has a considerable number of temporary accommodation providers. These range from large national hotel chains, as well as smaller independent hotels, serviced apartments, guest houses, hostels, and caravan sites.
- 13.5.13 Beyond the main local town centres, there are fewer services for construction workers to access. Based on professional judgement of construction projects where specialist contractors temporarily relocate during construction, the accommodation providers within Chester (and further afield in Liverpool) are most likely to be used and favoured by construction workers as this is where they would be able to access a variety of services (such as supermarkets, shops, and other facilities) most easily.

Future Baseline

- 13.5.14 The Local and Regional Study Areas for the socio-economic assessment are diverse, with mixed industrial, commercial, residential, and agricultural uses. Future development is guided by local plan documents published by CWCC. However, the general themes of relevance to socio-economics are economic growth, diversification of industry, and the delivery of new employment and training opportunities for residents.
- 13.5.15 Should the Proposed Development not proceed, it is anticipated that existing industrial related uses within the wider SMC would remain present and operational with a similar industry composition. It is likely that in the absence of the Proposed Development, similar industrial or manufacturing activities would take place at the Site. This is linked to the development of new energy capture and transmission projects in the north west, as part of achieving net-zero emissions targets in England in order to contribute to greater climate resilience. Development of energy related projects are a significant source of economic growth currently, with support for employment and training in emerging technologies as part of national and local planning policies.

13.6 Mitigation Measures

Embedded Mitigation

- 13.6.1 Relevant design, mitigation and enhancement measures will be identified in the ES. These are likely to include the adoption of Best Practicable Means, such as:
- the Applicant will work proactively to provide local employment opportunities and to enable access to training where possible;
 - the processes used to recruit and manage staff working at the Proposed Development will be demonstrably fair and offer equal opportunities to all; and
 - a commitment to the production of a Skills and Employment Plan will be made in the Outline CoCP, with the full Skills and Employment Plan prepared prior to the construction of the Proposed Development by the appointed contractor as part of the CoCP.

13.7 Description of Likely Significant Effects

Construction Phase

- 13.7.1 The potential significant effects associated with the construction phase may include:

- potential generation of direct, indirect and induced employment opportunities; and
- potential increased demand for temporary accommodation due to an influx of construction workers.

Operational Phase

- 13.7.2 No potential significant effects associated with the operational phase have been identified for socio-economics due to no new permanent direct, indirect and induced employment being created.

Scope

- 13.7.3 A summary of the proposed scope for the socio-economics construction and operational phase assessments is presented in **Table 13.7**.

Table 13.7 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Employment Generation (direct, indirect, and induced)	Construction	✓		Construction of the Proposed Development is anticipated to generate direct, temporary employment opportunities from construction workers onsite throughout the construction period; and indirectly through manufacturing services and suppliers of the construction process; and by construction workers spending part of their income in the area local to the Site. Temporary construction employment generation has the potential to be significant in the context of local and regional employment markets, benefitting residents in the Local and Regional Study Areas. Given the potential for significant numbers of direct, indirect and induced construction jobs that are anticipated to be created during construction of the

Element	Phase	Scoped In	Scoped Out	Justification
				Proposed Development, this has been scoped in for further assessment.
Increased Demand for Temporary Accommodation	Construction	✓		The construction of the Proposed Developments has the potential to affect the availability of tourist accommodation in the locality due to the influx of construction workers, some of whom may be required to reside close to the Proposed Development on a temporary basis and may require access to short term accommodation. As the number of construction workers is not known at the time of writing, this has the potential to give rise to significant construction phase effects on the availability of tourist accommodation. This has therefore been scoped in for further assessment.
Employment Generation (direct, indirect, and induced)	Operational		✓	The Proposed Development is anticipated not to generate any new permanent direct, indirect and induced employment. Whilst staff would be required for operation and maintenance of the Proposed Development, the staff from the proposed phased retirement of the existing CHP facility will mean that the overall number of site staff within the SMC is not anticipated to change. Therefore, operational employment generation as a result of the Proposed Development has been scoped out and will not be considered further as part of the assessment.

13.8 Assessment Methodology

- 13.8.1 There are no legislative requirements that exist in relation to socio-economics, and therefore the assessment is informed by the Government's planning policy and guidance including the ISEP Guidance (ISEP, 2017), as well as prior experience and professional judgement, to inform the assessment methodology outlined below.

Employment Generation

Approach to Assessment

- 13.8.2 The assessment methodology for the generation of employment associated with all components of the Proposed Development construction has been based on the HCA Employment Density Guide 3rd Edition (Homes and Communities Agency, 2015) and also by the Additionality Guide 4th Edition (Homes and Communities Agency, 2014). It should be noted that while both documents were withdrawn in 2022 no statement on replacement guides to be published by the UK Government has been made and both guides are still available for reference. It is considered that in the absence of any further guidance on employment density, these documents remain relevant and appropriate.
- 13.8.3 The assessment of likely significant effects relating to employment generation during the construction phase will be undertaken. Gross employment projections will be provided by the Applicant (based on their past experience of developing similar facilities, due to the specialist nature of the Proposed Development and the requirement for a skilled construction labour force). Leakage, displacement, and multiplier factors will then be applied to determine the total net employment generation.

Leakage

- 13.8.4 Leakage effects are the *"proportion of outputs that benefit those outside of the intervention's target area or group"* (Homes and Communities Agency, 2014). Leakage rates will be applied to construction employment calculations. On the basis of travel to work data, past experience and expert judgement, a medium leakage rate (as set out in the HCA Additionality Guidance (Homes and Communities Agency, 2014)) of 25% has been applied.

Displacement

- 13.8.5 Displacement measures the extent to which the benefits of a project are offset by reduction of output or employment elsewhere. Additional demand for labour as a result of the construction phase of the Proposed Development cannot simply be

treated as a net benefit as it has the potential to remove workers from other positions, and the net benefit is therefore reduced by the extent that this occurs.

- 13.8.6 Overall, it is assumed that due to the flexibility of the labour market and the fact that construction workers at the Proposed Development are likely to represent a small proportion of the regional construction labour force, displacement of the direct construction employment will be low. In line with the HCA Additionality Guide (Homes and Communities Agency, 2014), within the context of a north west construction project, a low level of displacement of 25% is considered appropriate, where *“there are expected to be some displacement effects, although only to a limited extent”*.

Multiplier Effects

- 13.8.7 In addition to the direct employment generated by the Proposed Development itself, there will be an increase in local employment arising from *“further economic activity (jobs, expenditure or income) associated with additional local income and local supplier purchases”* (Homes and Communities Agency, 2014), and the indirect and induced effects of the construction phase.
- 13.8.8 Employment growth will arise locally through manufacturing services and suppliers to the construction process (indirect or supply linkage multipliers). Additionally, it is expected that part of the income of the construction workers and suppliers will be spent in the region, generating further employment (induced or income multipliers).
- 13.8.9 The effects of the multiplier depend on the size of the geographical area that is being considered, the local supply linkages and income leakage from the area. The HCA Additionality Guidance (Homes and Communities Agency, 2014) provides a guide to the composite multipliers (the combined effect of indirect and induced multiplier effects), which should be applied. In line with the HCA Additionality Guide (Homes and Communities Agency, 2014), a medium multiplier of 1.5 has been applied on the basis that there are likely to be average supply linkages associated with the Proposed Development, based on its location within the north west.

Significance of Effect Criteria

- 13.8.10 The methodology for assessing employment generation will consider the likely direct, indirect and induced impacts associated with the Proposed Development during construction. For socio-economics, there is no accepted definition of what constitutes a significant (or not significant) socio-economic effect. It is however recognised that classification of an effect reflects the relationship between the scale of an impact (magnitude) and the sensitivity (or value) of the affected

resource or receptor. As such socio-economic effects will be assessed on the basis of:

- **Consideration of sensitivity to effects:** specific values in terms of sensitivity are not attributed to socio-economic resources/receptors due to their diverse nature and scale. However, the assessment takes account of the qualitative (rather than quantitative) 'sensitivity' of the receptor (employment and the economy).
- **Magnitude of the impact:** This entails consideration of the size of the effect on people (employees) in the context of the area in which effects will be experienced (the local and regional economy).

13.8.11 The assessment process aims to be objective and quantify effects as far as possible. However, many socio-economics effects can only be evaluated on a qualitative basis. Effects will be defined as follows:

- **Beneficial:** classifications of significance indicate an advantageous or beneficial effect on an effected area, which may be minor, moderate, or major in effect.
- **Negligible:** classifications of significance indicate imperceptible effects on an effect area.
- **Adverse:** classifications of significance indicate a disadvantageous or adverse effect on an affected area, which may be minor, moderate or major in effect.

13.8.12 Based on consideration of the above, where an effect is assessed as being beneficial or adverse, significance has been assigned using the scale below based on professional judgement.

- **Negligible:** no receptors (or very few) are beneficially or adversely affected. The effect is unlikely to make a measurable difference on the receptors in the relevant area(s) of effect.
- **Minor:** a small number of receptors are beneficially or adversely affected. The effect is likely to make a small measurable positive or negative difference on receptors in the relevant area(s) of effect.
- **Moderate:** a moderate number of receptors are beneficially or adversely affected. The effect is likely to make a measurable positive or negative difference on receptors in the relevant area(s) of effect.
- **Major:** all or a large number of receptors are beneficially or adversely affected. The effect is likely to make a substantial positive or negative difference on receptors in the relevant area(s) of effect.

- 13.8.13 The duration of effect is also considered, with more weight given to permanent changes than to temporary ones. Temporary effects are considered to be those associated with the construction phase, and may be short, medium or long term.
- 13.8.14 Effects that are deemed to be significant for the purpose of this assessment are those that are described as being moderate or major beneficial or adverse.

Increased Demand for Accommodation from Temporary Workers

- 13.8.15 An evaluation of the likely number of construction employees who may reside in the locality on a temporary basis will be undertaken. This will be based on the total number of construction employees combined with assumptions made by the Applicant associated with travel planning, construction methodologies, and the construction programme. A percentage of the overall construction employment workforce will be determined based on these factors. Consideration will be given to the types of tourist accommodation in the locality, including number of bedrooms, to determine whether additional pressure may arise on local accommodation facilities, in the context of existing availability and demand from tourists visiting the local area.

13.9 Assumptions and Limitations

- 13.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:
- This assessment has relied, in part, on data provided by third parties (e.g. Office for National Statistics), which are the most up-to-date data available at the time of writing. No significant changes or limitations in these datasets have been identified that would affect the robustness of the assessment.
 - Baseline data will be kept under review throughout the production of the EIA in order to ensure that (where practicable) the most recently published data is utilised.

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EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 14: Population and Human Health

02-09-2026

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14. Population and Human Health

14.1 Introduction

- 14.1.1 This chapter considers the potential impacts of the Proposed Development on population and human health during the construction, operational and decommissioning phases. It sets out the proposed methodology for the population and human health assessment and identifies impacts which can be scoped out of the EIA.
- 14.1.2 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.

14.2 Consultation and Engagement

- 14.2.1 There has been no consultation in the context of the Proposed Development, carried out in relation to population and human health, at the time of writing.
- 14.2.2 However, consultation was undertaken for CHP Phase 1 of the Combined Heat and Power (CHP) development. CHP Phase 1 is a Town and Country Planning Act regime application with determination anticipated later in 2026. This is relevant because the consultation undertaken on CHP Phase has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the Proposed Development.
- 14.2.3 The Proposed Development Scoping Opinion will inform the content and production of the Environmental Statement (ES).

14.3 Guidance

- 14.3.1 This chapter and the subsequent assessment will consider the following guidance:
- National Planning Practice Guidance (Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government, 2019a);
 - Planning Practice Guidance - Healthy and Safe Communities (Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government, 2019b);
 - Planning Practice Guidance - Open Space, Sports and Recreation Facilities, Public Rights of Way and Local Green Space (Department for Levelling Up,

Housing and Communities and Ministry of Housing, Communities and Local Government, 2019c);

- Design Manual for Roads and Bridges (DMRB) - LA 104 Environmental assessment and monitoring (DMRB, 2020a);
- DMRB – LA 112 Population and Human Health (DMRB, 2020b); and
- Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute Environmental Management and Assessment (IEMA)) Guidance – Effective Scoping of Human Health in Environmental Impact Assessment (IEMA, 2022).

14.4 Study Area

- 14.4.1 Due to the limited available guidance for the assessment of population and human health effects in EIA, DMRB LA 112 (DMRB, 2020b) provides an appropriate methodology to inform the assessment in the context of the Proposed Development, despite being written for the assessment of highways schemes. This approach is in line with prior experience and professional judgement.
- 14.4.2 The Study Area for this chapter for each element of the assessment is detailed in **Paragraphs 14.4.4 and 14.4.5**.
- 14.4.3 It should be noted that 'population' does not have a specific Study Area, as this chapter assesses the potential impacts on the population through effects associated with land use and accessibility, and human health.
- 14.4.4 The Study Areas for land use and accessibility have been defined below using the DMRB LA 112 (DMRB, 2020b), which advises a Study Area of 500m surrounding a development boundary where appropriate.
- 14.4.5 The Study Area for human health defined below has been informed by the Institute of Sustainability and Environmental Professional (ISEP) Guidance on 'Effective Scoping of Human Health in Environmental Impact Assessment' (IEMA, 2022), also taking account of the Proposed Development context within the Stanlow Manufacturing Complex (SMC).

Land Use and Accessibility

- 14.4.6 The study area for land use and accessibility includes the following receptor types:
- Private properties and housing allocations that lie within or have a direct means of access within 500m of the Site.

- Community land (e.g. open spaces) and community assets (e.g. community services, amenities and recreational facilities) that lie within 500m of the Site, or those which have a direct means of access within 500m of the Site.
- Businesses and land allocated for employment that lie within 500m of the Site, or those which have a direct means of access within 500m of the Site.
- Agricultural land holdings and assets that lie within 500m of the Site, or those which have a direct means of access within 500m of the Site.
- Public Rights of Way (PRoW) and non-designated routes within 500m of the Site, or those which have a direct means of access within 500m of the Site.

Human Health

- 14.4.7 Whilst there is no specifically defined Study Area for human health, the IEMA Guidance (IEMA, 2022) notes that health effects and their outcomes vary between geographical areas and that the geographical scope for health assessment should consider “*where there are likely and potentially significant site and local area effects...and focus on areas where the project would exert most influence*”, this is known as the Zone of Influence. In line with this, the Study Area for the human health assessment has been determined by the extent and characteristics of the Proposed Development, and the communities with the potential to be directly and indirectly affected by it.
- 14.4.8 As such, the Study Area is comprised of the jurisdiction boundaries whose populations are most likely to experience changes to their health outcomes. The smallest jurisdictional boundaries are Lower Super Output Areas (LSOA) however. Where possible, LSOAs have formed the basis of the Study Area for health because they are the communities that are most likely to experience direct and/or the greatest impacts. These populations fall within the Gowy Rural Ward.

14.5 Baseline Conditions

Existing Baseline

- 14.5.1 All measurements have been taken from the edge of the red line boundary closest to the receptor.
- 14.5.2 The key sources of information on baseline population and human health conditions are:
- Google Maps (n.d.);
 - Cheshire West and Chester Council Local Plan Map (n.d.);

- Fingertips Public Health Data (Office for Health Improvement and Disparities, n.d.);
- English Indices of Multiple Deprivation (Ministry of Housing, Communities & Local Government, 2019);
- Official Census and Labour Market Statistics (NOMIS) (Office for National Statistics, 2023); and
- Sustrans National Cycle Network Map (n.d).

14.5.3 The various geographical area profiles used to determine a baseline for human health and provide a comparison are as follows:

- National: England;
- Regional: North West England;
- Local Authority: Cheshire West and Chester;
- Ward: Gowry Rural; and
- LSOAs: Cheshire West and Chester 011D, and Cheshire West and Chester 022C.

Land Use and Accessibility

Private Property and Housing

- 14.5.4 Private property is housing, residential land and allocated development land that does not accommodate public space or any other community facility or assets. Commercial property is considered under the 'Development land and businesses' section below.
- 14.5.5 The principal land associated with the Study Area is industrial, with the works located within the SMC. The nearest residential settlement is Thornton-le-Moors, located approximately 70m south of the Site, while the village of Elton is located just outside of the Red Line Boundary, approximately 140m to the east of the Site.
- 14.5.6 In addition, there are two Gypsy and Traveller sites (as defined in the Equality Act (2010)) located within the Study Area. The first, Little Meadow Residential Caravan Park, is located 60m south of the Site and has four pitches. Little Meadow Residential Caravan Park is an unauthorised development that previously had temporary permission. However, Cheshire West and Chester Council (CWCC) is currently working on injunctions to remove it. The second gypsy and traveller site is located 130m southeast of the Site.
- 14.5.7 There is no land designated for housing development within the Study Area.

Community Land and Assets

- 14.5.8 Community land and assets typically comprise facilities to serve local residents, including education and healthcare, places of worship, and recreational facilities. Three community assets have been identified within the Study Area; St Mary's Church with an associated cemetery located approximately 220m south of the Site, Saint James the Great located approximately 330m, north of the Site and Elton Parish Field and Play area located approximately 390m east of the Site.
- 14.5.9 There are no other community land or assets within the Study Area or surrounding locality.

Development Land and Businesses

- 14.5.10 The Study Area is dominated by industrial uses, given its location in the SMC. Thornton Science Park is located within the Study Area adjacent to the red line boundary (and bounds of the wider SMC). The Park was previously owned by the University of Chester and was host to various local and national enterprises. However, the park was bought by the Applicant in July 2025. This land is currently used for office administration purposes.
- 14.5.11 Hayrack Church Farm Park and Café is located approximately 90m south of the Site in Thornton-le-Moors. The business consists of a farm park that is open to the public, a soft play area, a Café, as well as a butchers and farm shop.
- 14.5.12 The Cheshire Wildlife Trust (Holly Bank House office) is located approximately 70m south of the Site, off Pool Lane in Thornton-le-Moors.
- 14.5.13 The New Bridge Road employment allocation and Thornton Technology Park are two areas of strategic development land that have been designated in the CWCC Local Plan (Cheshire West and Chester Council, 2015) for development and are within the SMC.

Agricultural Land Holdings

- 14.5.14 Within the Site there is a small parcel of land to the east of Pool Lane which is classified as agricultural land. This is in the Applicant's ownership, with some areas occupied by woodland, brush, and scrub land. Given the land is not in active use for agricultural purposes (and the Applicant do not wish to use it as such), it is assumed that this would not constitute a loss of active agricultural land and there would be no associated impacts on an agricultural landowner or leaseholder.
- 14.5.15 There is limited agricultural land within the Study Area, most of which lies to the south of the Site in the area surrounding Thornton-le-Moors and some located to the east of the Site in the area surrounding Elton. Agricultural Land Classification within the Study Area, south of the A5117, is primarily classified as Grade 3 (good to moderate quality agricultural land) and Grade 4 (poor quality agricultural land)

and east of Pool Lane is classified as Grade 3. There are no agricultural businesses or farm premises identified within the Study Area.

Walkers, Cyclists and Horse Riders

- 14.5.16 Public access into the SMC is not permitted. However, there are several designated footpaths within the Study Area, many of which provide essential, daily connections for Walkers, Cyclists and Horse-riders (WCH) navigating within their local area, as outlined below (Cheshire West and Chester Council, n.d.):
- Thornton-le-Moors Footpath (FP) 1 (approximately 200m south of the Site);
 - Thornton-le-Moors FP 2 (approximately 220m south of the Site);
 - Thornton-le-Moors FP 3 (approximately 380m south of the Site);
 - Elton FP 1 (approximately 7m east of the Site); and
 - Elton FP 5 (approximately 200m south of the Site).
- 14.5.17 Additionally, the National Cycle Network (NCN) Route 5 is situated immediately to the south of the Site, along the A5117.
- 14.5.18 There are no designated bridleways within the Study Area.

Human Health

Age Breakdown

- 14.5.18.1 The percentages of population per age group for Cheshire West and Chester 011D and 022C, Cheshire West and Chester, the North West and England in 2021 can be seen in **Table 14.1**. Overall, the age group proportions for both LSOAs are broadly in line with the local authority, as well as regional and national averages. However, Cheshire West and Chester 011D has a larger proportion of children (aged 0-14), and Cheshire West and Chester 022C has a larger proportion of older people (aged 65+). Overall, the proportion of age groups is relatively similar between the LSOAs, the Local Authority, as well as the regional and national averages.

Table 14.1 Age breakdown for Cheshire West and Chester 011D, Cheshire West and Chester 022C, Cheshire West and Chester, North West and England, 2021 (Office for National Statistics, 2021)

Age Group (Years)	Cheshire West and Chester 11D		Cheshire West and Chester 022C		Cheshire West and Chester		North West		England	
	Total	%	Total	%	Total	%	Total	%	Total	%
0-15	684	25.7	202	15.7	61,792	17.3	1,391,762	18.8	10,483,091	18.5
16-24	267	10.0	95	7.7	34,436	9.6	798,023	10.7	5,989,233	10.6
25-64	1,475	55.3	683	53.2	185,175	51.8	3,841,296	51.7	29,616,422	52.4
65-84	217	8.1	275	21.4	66,020	18.5	1,215,489	16.4	9,029,000	15.9
85+	26	1.0	30	2.3	9,727	2.7	170,829	2.3	1,372,301	2.4

Population Health

14.5.19 Overall, the health of Cheshire West and Chester is in line with or better than the health status at both a regional and national level, as presented in **Table 14.2**. Cheshire West and Chester has better rates for ages under 75 deaths from cardiovascular disease, a lower percentage of obese children in Year 6, and a higher life expectancy for both males and females at birth. However, the area has worse rates for ages under 75 deaths from cancer and higher percentage of obese children in the final “Reception” year of Early Years Foundation Stage, compared to the England averages.

Table 14.2 Indicators of population health for Cheshire West and Cheshire, the North West, and England

Indicator	Indicator Value	Period	Cheshire West and Chester	North West	England
Life expectancy at birth for males	Years	2021 - 2023	79.4	77.5	79.1
Life expectancy at birth for females	Years	2021 - 2023	83.5	81.6	83.1
Obese children (EYFS Reception year)	%	2023/2024	9.7	10.1	9.6

Indicator	Indicator Value	Period	Cheshire West and Chester	North West	England
Obese children (Year 6)	%	2023/2024	20.2	23.3	22.1
Under 75 morality rate from all cardiovascular diseases	Standardised admission ratio	2023	75.9	93.8	77.4
Deaths from respiratory disease considered preventable, ages under 75	Standardised admission ratio	2024	N/A	27.1	19.6
Under 75 morality rate from Cancer	Standardised admission ratio	2023	130.7	134.5	120.8

Indices of Deprivation

- 14.5.20 The English Indices of Multiple Deprivation (IMD) comprises seven different 'domains', which relate to income, employment, education, health, skills and training, barriers to housing, and services to create an overall deprivation score.
- 14.5.21 The Site falls within the Cheshire West and Chester 011D and Cheshire West and Chester 022C neighbourhoods. These neighbourhoods ranked 10,079 and 9,727, respectively out of the 33,755 Lower Layer Super Output Areas (LSOAs) in England, where 1 is the most deprived and 33,755 is the least deprived (Ministry of Housing, Communities & Local Government, 2025). Therefore, both neighbourhoods are within the 30% most deprived neighbourhoods in England.

Proposed Development Topic Assessments relevant to Human Health

- 14.5.22 Other topic assessments that are relevant to the assessment of human health (and the potential for amenity effects for the population, particularly vulnerable groups) are considered here in order to identify any specific considerations relevant to the study area and the human health assessment.
- 14.5.23 There are no Noise Important Areas (NIAs) in proximity to the Site, as identified in **Chapter 6: Noise and Vibration**. The Site sits entirely within the Thornton-le-Moors Air Quality Management Area (AQMA) (see **Chapter 5: Air Quality**), and is also partially located within Flood Zones 1, 2 and 3 due to its location within the Weaver Gowry Catchment flood plain; where both fluvial and tidal flood risks are present (**Chapter 10: Water Environment and Flood Risk**).

- 14.5.24 **Chapter 9: Landscape and Visual** identifies residential properties and WCH users in the locality (particularly users of the NCN Route 5) as receptors likely to be sensitive to visual effects in the Study Area.
- 14.5.25 **Chapter 17: Transport and Movement** identifies a number of highway networks, strategic road network infrastructures, active travel networks and public transport within the Study Area.
- 14.5.26 **Chapter 13: Socio-economics** identifies that the Study Area has a comparable proportion of working-age residents and a similar level of job density. The assessment also indicates broad similarities in industry concentration across both the Local and Regional Study Areas when compared with national industry profiles. .
- 14.5.27 The baseline GHG emissions are zero, as set out in **Chapter 12: Greenhouse Gases** Additionally, **Chapter 11: Climate Resilience** identifies a changing UK climate, where recent decades have been warmer, wetter and sunnier than the 20th century on a national and local scale.
- 14.5.28 **Chapter 16: Ground Conditions and Soils** identifies a number of surface watercourses within the Study Area, including Gale Brook, Thornton Brook, River Gowy, Stanney Mill Brook, Manchester Ship Canal and River Mersey. The wider Stanlow Manufacturing Complex is also designated as a Control of Major Accident Hazards (COMAH) site.
- 14.5.29 **Chapter 18: Major Accidents and Disasters** has identified multiple low likelihood major accidents and disasters type throughout the Study Area, except for COMAH sites, major accident hazard pipelines, nuclear, fuel storage, fires, aviation, electricity and gas.
- 14.5.30 A full review of the health determinates that will inform the baseline conditions for air quality, landscape, noise, water, climate, socio-economics, GHGs, ground conditions, major accidents and traffic receptors are outlined in **Chapter 5: Air Quality, Chapter 6: Noise and Vibration, Chapter 9: Landscape and Visual, Chapter 10: Water Environment and Flood Risk, Chapter 11: Climate Resilience, Chapter 12: Greenhouse Gases, Chapter 13: Socio-economics, Chapter 16: Ground Conditions and Soils, Chapter 17: Transport and Movement and Chapter 18: Major Accidents and Disasters.**

Future Baseline

Land Use and Accessibility

- 14.5.31 The existing SMC is anticipated to remain operational in the future baseline. However, it is acknowledged that market fluctuations and economic factors cannot be predicted.
- 14.5.32 Private properties, businesses, community land and assets, as well as WCH routes within the Study Area are likely to remain in line with their current baseline states. The importance of adaptability of these receptors to the challenges of climate change is acknowledged. This has the potential to affect the types of businesses (as products and projects focused on achieving the aims of the UK's net zero carbon agenda continue to come forward); the approach to construction (with greater sustainable methods incorporated into development), and the way that communities function (with the importance of active travel, community cohesion and accessibility) in response to climate change.

Human Health

- 14.5.33 Between 2018 and 2043, the population of Cheshire West and Chester is anticipated to increase by 13.4%, whereas the population for England is anticipated to increase by 10% in the same period. Aging of the population is set to continue with those aged 65 and above in Cheshire West and Chester, with the greatest population increase expected at 38.6% between 2018 and 2043 (Ministry of Housing, Communities & Local Government, 2019).
- 14.5.34 This growth is likely to put strain on existing services and require additional housing, facilities, services and infrastructure.

Sensitive Receptors

- 14.5.35 The baseline has identified the following potential sensitive receptors within the Study Area:
- residents of private properties within Thornton-le-Moors (and within the Study Area);
 - users of St Mary's Church, Thornton-le-Moors, Saint James the Great Church, Ince and Elton Parish Field and Play area, Elton;
 - business operators, employees and customers/visitors of Hayrack Church Farm Park and Café, and the Cheshire Wildlife Trust (Holly Bank House office); and
 - users of the NCN Route 5 and the five WCH routes.

- 14.5.36 For human health the local population is deemed to be the sensitive receptor, rather than individuals. This is in line with IEMA's Guidance (IEMA, 2022). Human health focuses on the potential effects on vulnerable groups who are most likely to experience health impacts. In the context of the Proposed Development this is most likely to include older people, people with physical disabilities, and people with existing health conditions.

14.6 Mitigation Measures

Embedded Mitigation

- 14.6.1 Relevant design, mitigation and enhancement measures will be identified in the ES. These are likely to include the adoption of Best Practicable means, such as:
- Good practice measures will be outlined within the Outline Code of Construction Practice submitted alongside the ES in order to avoid conflict with WCH routes, local residents, and community facilities and ensure impacts from construction dust, noise and traffic are managed appropriately.
 - The appointed contractor will liaise with residents and businesses prior to the commencement of construction works to ensure they are aware of the programme and nature of the works, in particular, any works that are planned to take place at night. Any out of hours construction work to be agreed with CWCC.
 - A range of embedded mitigation measures from other technical environmental assessment topics are also relevant and may reduce impacts on human health, as outlined in **Chapter 5: Air Quality, Chapter 6: Noise and Vibration, Chapter 9: Landscape and Visual, Chapter 10: Water Environment and Flood Risk, Chapter 11: Climate Resilience, Chapter 12: Greenhouse Gases, Chapter 13: Socio-economics, Chapter 16: Ground Conditions and Soils, Chapter 17: Transport and Movement and Chapter 18: Major Accidents and Disasters.**

Additional Mitigation

- 14.6.2 There is no additional mitigation that has been identified, which is relevant to population and human health.
- 14.6.3 The secondary access to the SMC, located on the A5117, is relevant to the assessment. This is currently an emergency access point and will be used during the construction phase when there is an abnormal load. Upon completion of construction, it is assumed that the access road will remain a permanent feature of the Proposed Development. When this occurs, a portion of the A5117 near this gate would be closed and WCH and vehicular movements stopped for safety

purposes. Closures would be temporary and in agreement with CWCC, and access to the Site from the A5117 will not take place for other reasons during construction.

14.7 Description of Likely Significant Residual Effects

Construction Phase

- 14.7.1 Although there are population and human health receptors identified within the Study Area, as outlined in **Section 14.5**, the sensitivity of these receptors as a result of the Proposed Development is unlikely to be significantly adversely affected by the construction activities. The construction activities will not give rise to a change in their experience (with regard to access, function, or amenity of these receptors) and the magnitude of change associated with this in relation to the construction phase will not result in significant effects on these receptors.
- 14.7.2 As such, no potential significant effects associated with the construction phase have been identified for population and human health.

Operational Phase

- 14.7.3 No potential significant effects associated with the operational phase have been identified for population and human health.

Scope

- 14.7.4 A summary of the proposed scope for the population and human health construction and operational phase assessments is presented in **Table 14.3**.

Table 14.3 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Private Property and Housing	Construction and Operational		✓	Due to the contained nature of the construction works and distance of the Site in relation to private properties in the locality, it is anticipated that effects on access and disruption for residents in Thornton-le-Moors, Elton, the Little Meadow Residential Caravan Park and at the second Caravan Park would be negligible. The construction works are expected to be temporary and medium term in nature (over a sixteen-month period) and construction traffic will use the main Pool Lane access. The exception will be the infrequent use of a secondary access located on the A5117, solely for abnormal loads. The construction of the Proposed Development is not likely to impact access to properties via the surrounding road network, which has good linkages for residents in the locality. Once operational the Proposed Development is not likely to have a significant effect on private property and housing, particularly in the context of the baseline levels of heavy industrial activities at and surrounding the Site. Therefore, effects are not considered likely to be significant.
Community Land and Assets	Construction and Operational		✓	There are limited community land uses and assets located within the Study Area, with three receptors identified, St Mary's Church in Thornton-le-Moors, Saint James the Great Church in Ince and Elton Parish Field and Play area in Elton. Access to, or use of the churches and playing field will not be affected by construction or operational activities. Therefore, effects are not considered likely to be significant.

Element	Phase	Scoped In	Scoped Out	Justification
Development Land and Businesses	Construction and Operational		✓	Due to the contained nature of the construction works and distance of the Site in relation to businesses in the locality, it is anticipated that effects on access and disruption for businesses and their users would be negligible. The Proposed Development will be contained within the SMC, and although Thornton Science Park is in close proximity to the Site, access to the Park is separate from the Proposed Development and is therefore unlikely to be affected. Access to other businesses in the locality (including the Hayrack Church Farm Park and Café) will be unaffected during construction, therefore no significant effects are likely to occur. Once operational, the Proposed Development is not anticipated to result in any impacts to nearby businesses. Therefore, effects are not considered likely to be significant.
Agricultural Land Holdings	Construction and Operational		✓	There are no agricultural land holdings within the Study Area, and no agricultural land take will be required during construction or operational. Therefore, no effects are anticipated to arise.
Walkers, Cyclists and Horse-riders	Construction		✓	The users of NCN Route 5 and Elton FP 1 have the potential to be temporarily affected during construction as a result of potential construction vehicle movements. However, abnormal load vehicles accessing the Site via the A5117 and intersecting the pedestrian footpath and cycle path will be infrequent and managed with temporary road closures. Pool Lane is likely to be used as one of the main routes for construction traffic, and therefore due to the location of Elton FP 1 and NCN Route 5 there is also potential for disruption WCH users who use these routes between Elton and the A5117. Given the context of

Element	Phase	Scoped In	Scoped Out	Justification
				existing traffic accessing the SMC via Pool Lane, it is anticipated that effects on access and disruption for WCHs would be minor. Therefore, effects are not considered likely to be significant.
WCH	Operational		✓	Once operational, the Proposed Development is not anticipated to result in any impacts to WCH routes. Therefore, effects are not considered likely to be significant.
Human Health	Construction and Operational		✓	The works are not likely to have a significant impact on the local population, as the additional works are not likely to cause a significant adverse impact, when compared with the baseline conditions of the existing Site. Whilst there is potential for direct adverse health effects as a result of the Proposed Development these are not anticipated to be significant. Any human health effects identified in Chapter 5: Air Quality, Chapter 6: Noise and Vibration, Chapter 9: Landscape and Visual, Chapter 10: Water Environment and Flood Risk, Chapter 11: Climate Resilience, Chapter 12: Greenhouse Gases, Chapter 13: Socio-economics, Chapter 16: Ground Conditions and Soils, Chapter 17: Transport and Movement and Chapter 18: Major Accidents and Disasters will be assessed within the respective ES chapters, and mitigation considered where relevant and appropriate.

14.8 Assessment Methodology

14.8.1 As documented in **Section 14.7** it is proposed that population and human health will be scoped out of the EIA, and no further desk-based or impact assessment is considered to be required.

14.9 Assumptions and Limitations

14.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- This chapter relies on, in part, data provided by third parties (e.g. Ordnance Survey Mapping, Local Authorities, NOMIS) which are the most up-to-date, available at the time of writing. No significant limitations in these datasets have been identified that would affect the outcome of this assessment.

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PUBLIC

EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 15: Materials and Waste**

02-09-2026

Document ref: 2026UK550445-ENV-001



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15. Materials and waste

15.1 Introduction

- 15.1.1 This chapter considers the potential impacts of the Proposed Development on the receptors from materials use and waste generation during the construction and operational phases. It sets out the proposed methodology for the materials and waste assessment and identifies impacts that can be scoped out of the Environmental Impact Assessment (EIA).
- 15.1.2 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.

15.2 Consultation and Engagement

- 15.2.1 There has been no specific consultation carried out in relation to the development of the materials and waste Scoping chapter at the time of writing.
- 15.2.2 Feedback in relation to this topic and the scope of works will be gained as part of the Proposed Development EIA Scoping Opinion, and this will inform the production of the Environmental Statement (ES).
- 15.2.3 Consultation was undertaken previously for the Combined Heat and Power (CHP) Phase 1 Town and Country Planning Application (TCPA). Comments from the Environment Agency in relation to Ground Conditions included advice on waste management, specifically relating to the reuse of onsite arisings (where suitably characterised) and legal requirements for offsite disposal of waste. It was noted in the CHP Phase 1 TCPA environmental assessment that this would be the responsibility of the Principal Contractor.

15.3 Guidance

- 15.3.1 This chapter has, and when undertaking the assessment for the ES will, give consideration to the following guidance:
- Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management & Assessment (IEMA)) Guide to Materials and Waste in Environmental Impact Assessment (herein referred to as the 'ISEP Guide') (ISEP, 2020).

15.4 Study Area

15.4.1 The Study Areas for the assessment of impacts related to materials and waste are defined in line with the ISEP Guide:

- The **Development Study Area** (the Site). This comprises the Site, including areas required for temporary access, site compounds, working platforms and other enabling activities.
- Where data are available, the **Expansive Study Area** extends to the availability of construction materials and the capacity of waste management facilities within the regions where the Proposed Development is located: the North West England region (Local Authority areas of Cheshire, Cumbria, Greater Manchester, Lancashire, Merseyside, Warrington, and Halton¹) and North Wales (Conwy, Denbighshire, Flintshire, Gwynedd, Isle of Anglesey, Powys, and Wrexham)². For context, data for the United Kingdom (UK) is also provided.

15.5 Baseline Conditions

15.5.1 This section of the materials and waste chapter describes baseline material consumption and waste disposal for the current land use. It also provides regional and national information and data in the context of which environmental assessment can be undertaken.

15.5.2 The most up to date sources of information have been used to collate data for material resource availability, landfill capacity and waste recovery. Indication of the most recent year from which data has been acquired is provided throughout. The baseline data collected and presented in this section were obtained by desk-study, from publicly available data sources, and include:

- Department for Business and Trade, Building Materials and Components Statistics (Department for Business and Trade, 2024);
- Mineral Products Association, Profile of the UK Mineral Products Industry, 2025 Edition (Mineral Products Association, 2025);
- UK Steel, Key Statistics Guide, 2025 (UK Steel, 2025);
- North West Aggregates Working Party (NWAWP) Annual Monitoring Report 2025 (NWAWP, 2026);
- Cheshire West and Chester Council Minerals Safeguarding Guidance Note and interactive map (Cheshire West and Chester Council, n.d.);

¹ The Local Authority areas align with the Environment Agency Waste Data Interrogator tool used to inform the baseline of this chapter.

² Where no data for North Wales are available, data for Wales has been used.

- 2024 Waste Data Interrogator (Environment Agency, 2026);
- Waste Permit Returns Data Interrogator 2024 (Natural Resources Wales, 2025);
- Remaining Landfill Capacity (Environment Agency, 2025); and
- Estimated Landfill Void Wales 2018 (Natural Resources Wales, 2018).

Existing Baseline

Materials

Materials Resources Currently Required

- 15.5.3 The existing land use of the Site comprises open storage areas on hardstanding, buildings and internal road access routes forming part of the wider Stanlow Manufacturing Complex (SMC). The consumption of primary material resources is limited to minor maintenance and repair works (for example road surface repairs). Professional judgement can be used to assert that by comparison with regional and national availability of resources (shown in **Table 15.1**), consumption of materials in the current baseline is minimal.

Material Resource Availability

- 15.5.4 **Table 15.1** provides a summary of the availability of the main construction materials in North West England and the UK. The materials listed are considered to be appropriate to the bulk construction materials required for the Proposed Development. The overview excludes technological products but provides a proportionate context in which the assessment of effects from material consumption can be undertaken.

Table 15.1 Construction materials availability in North West England and the UK, 2024

Material Type	North West England	Wales	UK
Production of sand and gravel (Mineral Products Association, 2025)	1.4Mt	1.5Mt	54.1Mt
Production of crushed rock (Mineral Products Association, 2025)	5.9Mt	12.8Mt	132.2Mt

Material Type	North West England	Wales	UK
Production of primary aggregate* (Mineral Products Association, 2025)	7.3Mt	14.3Mt	186.3Mt
Recycled and secondary aggregate	1.0Mt (sales of) (NNAWP, 2026)	(no data)	74.7Mt (GB) (production of) (Mineral Products Association, 2025)
Production (stocks) of concrete blocks (Department for Business and Trade, 2024)	2.2Mm ² (North)	1.2Mm ² (Scotland and Wales)	6.6Mm ² (GB)
Production of ready-mix concrete (Mineral Products Association, 2025)	1.9Mm ³	0.9Mm ³	21.9Mm ³ (UK)
Production of steel (UK Steel, 2025)	(no data)	(no data)	4.0Mt (UK)
Production of Asphalt (Mineral Products Association, 2025)	2.2Mt	1.2Mt	23.5 (UK)
Notes: *The data for primary aggregates comprises crushed rock and sand and gravel. The UK figure for primary aggregates includes Northern Ireland, whereas the data for crushed rock and sand and gravel excludes Northern Ireland. - Where the data format (production or sales) differs between regional and country wide data, this has been stated in brackets. - Data is based on 2024 figures unless otherwise stated. - GB: Great Britain (England, Wales and Scotland) figures used where UK figures (including Northern Ireland) are unavailable.			

15.5.5 Mineral Planning Authorities monitor aggregate reserves and should maintain landbanks of a minimum of seven years supply for sand and gravel, and ten years supply for crushed rock. The NNAWP Annual Monitoring Report 2025 (2026) notes that at the end of 2024, there were land banks of 5.49 years for sand and gravel, and 32.3 years for crushed rock. The Annual Report notes the need for additional planning permissions for the extraction of sand and gravel to prevent supply issues within the region. It is further noted that marine dredged sand and gravel reserves could be utilised to aid the potential shortfall in sand and gravel reserves.

- 15.5.6 Across North West England, Wales and the UK, the availability of other materials resources typically required for construction schemes, or maintenance and repair works during operation, indicates that stocks/production/sales remain buoyant. The available data shows that the North West of England region has a higher than average availability of stocks of concrete blocks. Within Wales, the sales of permitted crushed rock are slightly above the average for all UK regions. However, production of sand and gravel within the North West of England and Wales are below the UK average, as are the production of ready-mix concrete and stocks of concrete blocks within Wales.
- 15.5.7 The Cheshire West and Chester Council Mineral Safeguarding Guidance Note and interactive map (n.d.) details the location of minerals safeguarding sites. The Site does not include any mineral safeguarding areas.

Waste

Waste Generation and Disposal

- 15.5.8 The existing land use of the Site generates minimal volumes of site arisings and waste for disposal to landfill, given the nature of the land use (storage, building, road infrastructure). Some minimal quantities of waste generated may require disposal to landfill (such as packaging and general litter). Any waste generated is currently managed through the Applicants legal requirement to apply the Waste Hierarchy (as required within the Waste (England and Wales) Regulations 2011 which implements the Waste Framework Directive, and existing waste management policies implemented by the Applicant across the SMC.

Waste Recovery Infrastructure and Remaining Landfill Capacity

- 15.5.9 Data from the latest Environment Agency Waste Data Interrogator (Environment Agency, 2026) demonstrates that in 2024, the North West of England had 987 waste recovery sites, which diverted 83% (6,703,073 tonnes) of waste from landfill.
- 15.5.10 For Wales, data from the Waste Permit Returns Data Interrogator (Natural Resources Wales, 2025) shows that in 2024 Wales had 163 waste recovery sites, which diverted 95% (3,126,873 tonnes) of waste from landfill.
- 15.5.11 Data include the total waste received from both within the subject region and from other regions in the UK. The recovery rates demonstrate that there is infrastructure available to aid in the diversion of waste from landfill.
- 15.5.12 The latest data from the Environment Agency (Environment Agency, 2025) for the North West of England confirms that at the end of 2024, 28 landfill sites were recorded as having 26,421,901m³ of remaining capacity. Data in **Table 15.2** summarises this information by landfill type.

Table 15.2 Remaining landfill capacity in North West England (2024)

Landfill type	Capacity in 2023 (m ³)	Remaining capacity in 2024 (m ³)	2023 to 2024 change in capacity (Mm ³) and percentage
Hazardous (merchant)	3,009,862	2,826,434	-0.2 (-6.1%)
Hazardous (restricted*)	0	0	0 (0%)
Inert	5,278,827	5,019,677	-0.3 (-4.9%)
Non-hazardous (including stable hazardous waste cells)	17,660,736	18,575,790	0.9 (5.2%)
Total	25,949,425	26,421,901	0.5 (1.8)
Notes	*Restricted landfill sites only accept waste from restricted sources and producers, e.g. site operator / managing site.		

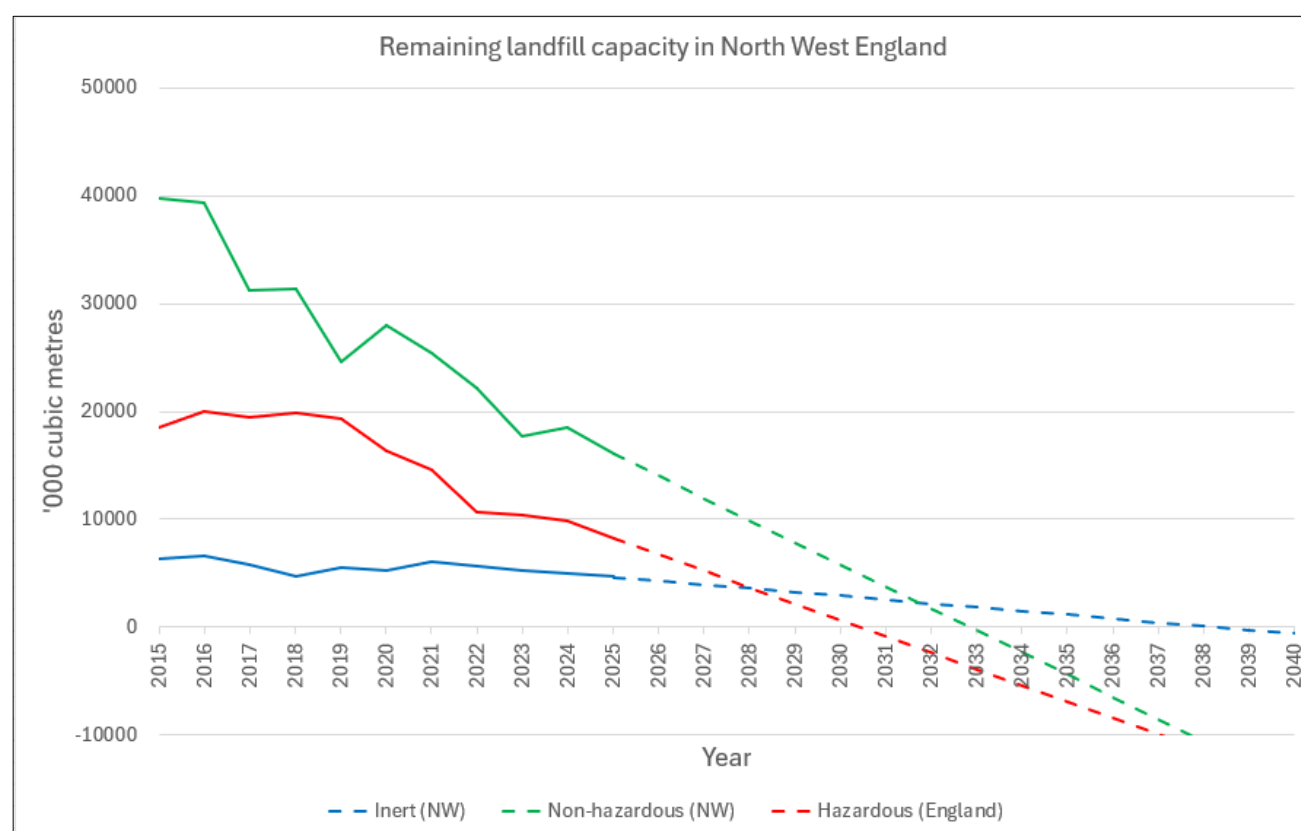
15.5.13 The latest available data on remaining landfill capacity for Wales dates from 2018 (Natural Resources Wales, 2018) and is shown in **Table 15.3**, summarised by landfill type. There were seven landfill sites with just under 6Mm³ of available capacity. There have been no updates to this data since publication in 2018.

Table 15.3 Remaining landfill capacity in Wales (2018)

Landfill type	Remaining capacity in 2018 (m ³)
Hazardous	0
Inert	1,014,676
Non-hazardous (including stable hazardous waste cells)	2,434,154
Total	5,715,061

- 15.5.14 As shown in **Plate 15.1**, simple statistical forecasting (using the Microsoft Excel forecasting function) has been used to demonstrate long term remaining landfill capacity to the year of the Proposed Development's planned commissioning (see **Chapter 2: The Proposed Development**) in the absence of future provision. Data for the years 2015 to 2024 have been obtained from the 2024 waste summary tables for North West England (Environment Agency, 2026).
- 15.5.15 Forecasting beyond the construction phase is not considered a robust data assumption given the uncertainty around additional landfill capacity, or development waste management methods in the future.

Plate 15.1 Forecast remaining landfill capacity in North West England



- 15.5.16 In the absence of future provision, regional landfill capacity will become an increasingly sensitive receptor throughout the duration of the construction phase and into operation. As such, diverting waste from landfill through waste avoidance, reuse, recycling and recovery will be an important measure to implement for the Proposed Development.
- 15.5.17 Due to the lack of historical data, it has not been possible to present a forecast for remaining landfill capacity in Wales at the time of writing.

Future Baseline

- 15.5.18 In the future baseline and in the absence of the Proposed Development, it is considered that the current land use within the Site Boundary will remain the same. As such, the consumption of materials resources and disposal of waste to landfill will remain minimal.
- 15.5.19 The impact that climate change may have on sensitive receptors for the materials and waste chapter is considered minimal. Climate change may have short duration impacts on the extraction of raw materials and landfilling of waste during extreme weather events. Extreme weather events may result in flooding, heatwaves or storms that may prevent access to material and waste sites, slow down or suspend material production and waste disposal operations on a temporary basis. It is therefore anticipated that there would be no significant disruption to the availability of material resources, or the disposal of waste as a result of climate change.

15.6 Description of Likely Significant Effects

- 15.6.1 Potential likely significant effects for materials and waste may arise through:
- The consumption of large quantities of materials, which could have a potentially significant adverse effect on the environment through the depletion of natural resources.
 - Waste generated by the Proposed Development: The potential for significant effects from waste disposal is commensurate with a reduction in regional landfill void capacity; landfill capacity is considered a sensitive receptor in North West England and Wales.

Construction Phase

- 15.6.2 For the construction phase, a summary of materials likely to be required is provided in **Table 15.4**. This has been included for indicative purposes and the data will be refined for presentation within the ES.

Table 15.4 Indicative summary of materials required during construction phase

Material Type	Indicative Quantity
Concrete	27,000m ³
Reinforcement steel	2,271 tonnes
Ground Improvement-Rigid Inclusions comprising concrete	5,100m ²

Material Type	Indicative Quantity
Steel sheet pile wall (temporary)	5,036m ²
Steel parts and equipment (e.g. anchor bolts and plates; pipe rack, supports; platform)	4,666 tonnes
Reinforced cement pipes (300mm diameter)	2,559m
Imported soil	45,000m ³
Imported sand (filling)	270m ³
Timber formwork	53,466m ²
WBM (Water Bound Macadam) road	750m ³
Non shrink grouting	25m ²
40mm thick grating plates	900m ²

- 15.6.3 In addition to the above information, the Applicant has indicated that excavated soil can be reused on site with 65% to be used in back filling and 35% retained within the refinery at a designated location, which may require environmental permitting. These values are indicative at the current design stage and will be reviewed for presentation within the ES.

Operational Phase

- 15.6.4 During the operational phase, material resources may be required for routine maintenance and repair work but would not be consumed in volumes large enough to generate potential significant effects.
- 15.6.5 During operation, the Applicant has confirmed that negligible quantities of solid waste will be generated during the operation of the CHP facility. Whilst it is anticipated that some waste will be generated (such as commercial type waste from employees' activities and construction and demolition waste from maintenance and repair activities), the volumes generated are not anticipated to be large and therefore will not result in significant effects.
- 15.6.6 Furthermore, the Applicant has a dedicated Waste Management Procedure for their existing operations which sets out measures to fulfil legal obligations and waste management duty of care (Essar Oil UK, 2025). This Waste Management Procedure, and the application of the Waste Hierarchy will be applied to any waste in line with legislative requirements.

Scope

15.6.7 A summary of the proposed scope for the materials and waste construction, operational phase and decommissioning assessments is presented in **Table 15.5**.

Table 15.5 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Consumption of material resources	Construction	✓		Based on the indicative information available to date, there is a potential for the construction phase to have adverse impacts on material resources, however further detail is required to fully assess the potential impacts.
Consumption of material resources	Operational		✓	Operational activities of the Proposed Development are not anticipated to require consumption of material resources beyond those necessary for routine repair and maintenance. As such, the impacts associated with material resource consumption are considered to be minimal and not significant. As such, they are scoped out from further assessment.
Generation and disposal of waste	Construction	✓		Further detail is required to assess the potential impacts of the Proposed Development on existing waste infrastructure and landfill capacity. The assessment will reconfirm remaining landfill capacity and identify measures committed to by the Applicant to ensure the responsible management and disposal of construction and demolition waste.
Generation and disposal of waste	Operational		✓	Operational activities of the Proposed Development are not anticipated to generate large volumes of solid waste. Waste generated will be limited to commercial waste generated by employees, and construction and demolition waste from routine repair and maintenance. The Applicant will implement the Waste Hierarchy as per legislative requirements. As such, the impacts associated with waste

Element	Phase	Scoped In	Scoped Out	Justification
				generation and disposal in operation are considered to be minimal and not significant.

15.7 Mitigation Measures

15.7.1 The following embedded mitigation measure in relation to materials and waste has been identified based on the current stage of the design. This will be reviewed and updated at ES stage:

- All earthwork arisings generated from excavation works are anticipated to be recovered and reused during construction depending on the suitability of the resource for reuse, once it has been excavated and tested. Where earthworks cannot be reused as backfilling for the Proposed Development, the materials will be retained within the refinery at a designated location; where a defined use cannot be found, alternative management options will be explored. The disposal location for these arisings will be determined by the contractor and specified in relevant documentation with relevant environmental permitting in place.
- The reuse of earthworks represents a reduction in the adverse impacts of waste generation by the Project. The resulting diversion of this waste from landfill will reduce adverse effects on landfill as a sensitive receptor.

15.7.2 At ES stage, the assessment of likely significant effects will determine if any additional mitigation measures are required in order to reduce likely significant effects.

15.8 Likely Significant Residual Effects

15.8.1 As described in **Chapter 2: The Proposed Development**, it is understood that some demolition is required to accommodate the Proposed Development dependent on finalisation of design configuration. Demolition of existing redundant infrastructure includes the Tenko office/warehouse, MP boiler house, Demineralisation plant, Poly store, 2 x shelters, and Substation 86. This will generate demolition waste that will need to be managed and disposed of and will be considered further in the ES.

15.8.2 Given the volumes of materials noted in **Table 15.4**, there is a potential that the Proposed Development may give rise to significant effects in relation to material resource. This will be assessed further within the ES.

- 15.8.3 Furthermore, there is no information on the expected types and quantities of waste to be generated during construction of the Proposed Development. This will include disposal of contaminated excavated arisings and site clearance of some of the woodland areas within the Red Line boundary as part of the construction phase which may give rise to significant effects in relation to waste generation and disposal. This will be assessed within the ES.

15.9 Assessment Methodology

- 15.9.1 The ISEP Guide (ISEP, 2020) will be used to assess the likely significant effects from the Proposed Development, using the process and significance criteria it sets out. It is anticipated that Method W1 (Void Capacity, as detailed in the ISEP Guide) will be used to best reflect the scale and nature of the Proposed Development.
- 15.9.2 In accordance with the ISEP Guide (ISEP, 2020), the assessment will be a quantitative exercise that aims to identify the following:
- the type and volume of materials to be consumed by the Proposed Development, including details of any recycled materials content;
 - the type and volume of waste to be generated by the Proposed Development, with details of planned recovery and/or disposal method (for example onsite reuse, offsite recycling, disposal to landfill);
 - the cut and fill balance; and
 - details of any materials to be specified, where sustainability credentials (particularly those that improve resource efficiency) afford performance beyond expected industry standards.
- 15.9.3 The impacts from the Proposed Development that will be considered in the assessment include:
- anticipated reductions in availability (stocks, production and/or sales) of materials regionally and nationally from the consumption of materials required for the Proposed Development; and
 - anticipated reductions in the landfill void capacity of regional and national infrastructure as a result of waste generated by the Proposed Development.
- 15.9.4 The likely types and estimated quantities of material resources required (including site arisings generated) for the Proposed Development will be assessed. Impacts and effects will be evaluated against data for the regional and national materials markets, where information is available.

- 15.9.5 The likely types and estimated quantities of waste to be generated by the Proposed Development will be assessed. Impacts will be evaluated against the capacity of regional (or where justified, national) waste management infrastructure.
- 15.9.6 The criteria for assessing sensitivity and magnitude are set out in **Table 15.6** and **Table 15.7**. The sensitivity of waste is determined by considering the baseline/future baseline of regional (or where justified, national) landfill void capacity.

Table 15.6 Materials and waste sensitivity criteria

Sensitivity	Materials Criteria: On balance, the key materials required for the Proposed Development...	Inert and non-Hazardous Waste Criteria: Landfill void capacity is expected to...	Hazardous Waste Criteria: Landfill void capacity is expected to...
Negligible	...are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock; and/or ...are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials*.	...remain unchanged or is expected to increase through a committed change in capacity.	...remain unchanged or is expected to increase through a committed change in capacity.
Low	...are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock; and/or ...are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials*.	...reduce minimally: by <1% as a result of wastes forecast.	...reduce minimally: by <0.1% as a result of wastes forecast.
Medium	...are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock; and/or	...reduce noticeably: by 1-5% as a result of wastes forecast.	...reduce noticeably: by 0.1-0.5% as a result of wastes forecast.

Sensitivity	Materials Criteria: On balance, the key materials required for the Proposed Development...	Inert and non-Hazardous Waste Criteria: Landfill void capacity is expected to...	Hazardous Waste Criteria: Landfill void capacity is expected to...
	...are available comprising some sustainable features and benefits compared to industry-standard materials*.		
High	...are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock; and/or ...comprise little or no sustainable features and benefits compared to industry-standard materials.	...reduce considerably: by 6-10% as a result of wastes forecast.	...reduce considerably: by 0.5-1% as a result of wastes forecast.
Very High	...are known to be insufficient in terms of production, supply and/or stock; and/or ...comprise no sustainable features and benefits compared to industry-standard materials.	... reduce very considerably (by >10%); end during construction or operation; is already known to be unavailable; or, will require new capacity or infrastructure to be put in place to meet forecast demand.	... reduce very considerably (by >1%); end during construction or operation; is already known to be unavailable; or, will require new capacity or infrastructure to be put in place to meet forecast demand.
Notes: * Assessment of the proportion of sustainable features (very high, high, some, none) is undertaken using professional judgement. - Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: - comprise reused, secondary or recycled content (including excavated and other arisings); - support the drive to a circular economy; or - in some other way reduce lifetime environmental impacts.			

Table 15.7 Materials and waste magnitude criteria

Magnitude	Materials Criteria: The assessment of the Proposed Scheme is made by determining whether the consumption of...	Inert and non-hazardous waste criteria: The percentage depletion of remaining landfill void capacity	Hazardous waste criteria: The percentage depletion of remaining landfill void capacity
No change	...no materials are required.	Zero waste generation and disposal from the development.	Zero waste generation and disposal from development.
Negligible	...no individual material type is equal to or greater than 1% by volume of the regional* baseline availability.	Waste generated by the development will reduce regional* landfill void capacity baseline*** by <1%.	Waste generated by the development will reduce national landfill void capacity baseline*** by <0.1%.
Minor	...one or more materials is between 1-5% by volume of the regional* baseline availability; And/or the development has the potential to adversely and substantially** impact access to one or more allocated mineral site (in their entirety), placing their future use at risk.	Waste generated by the development will reduce regional* landfill void capacity baseline*** by 1-5%.	Waste generated by the development will reduce national landfill void capacity baseline*** by <0.1-0.5%.
Moderate	...one or more materials is between 6-10% by volume of the regional* baseline availability; and/or one allocated mineral site is substantially** sterilised by the development rendering it inaccessible for future use.	Waste generated by the development will reduce regional* landfill void capacity baseline*** by 6-10%.	Waste generated by the development will reduce national landfill void capacity baseline*** by <0.5-1%.
Major	...one or more materials is >10% by volume of the regional* baseline availability; and/or more than one allocated mineral site is substantially**	Waste generated by the development will reduce regional* landfill void capacity baseline*** by >10%.	Waste generated by the development will reduce national landfill void capacity baseline*** by >1%.

Magnitude	Materials Criteria: The assessment of the Proposed Scheme is made by determining whether the consumption of...	Inert and non-hazardous waste criteria: The percentage depletion of remaining landfill void capacity	Hazardous waste criteria: The percentage depletion of remaining landfill void capacity
	sterilised by the development rendering it inaccessible for future use.		
Notes: * or where justified, national. ** justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed. *** forecast as the worst-case scenario to the end of the Construction Stage timeframe.			

Significance Criteria

15.9.7 The outputs of comparing sensitivity against magnitude will be assessed against the significance of effects matrix provided within Section 10 of the ISEP Guide, replicated in **Table 15.8**. Effects that are classified as moderate, large or very large are considered to be significant, for both materials and waste. Effects classified as slight or neutral are considered to be not significant in either case.

Table 15.8 Matrix to assign significance of effect category

		Sensitivity of Receptor				
		Negligible	Low	Medium	High	Very high
Magnitude of Impact	No change	Neutral	Neutral	Neutral	Neutral	Neutral
	Negligible	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight
	Minor	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate	Slight or Moderate
	Moderate	Neutral or Slight	Slight	Moderate	Moderate or Large	Large or Very Large
	Major	Slight	Slight or Moderate	Moderate or Large	Large or Very Large	Very Large

15.10 Assumptions and Limitations

15.10.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The assessment of materials and waste is based upon the validity of the collated information, regarding the resources that are expected to be consumed, and the waste generated and disposed of during the construction and operational phases of the Proposed Development.
- The assessment baseline uses the most recent available data, which is up to and including 2024 (unless stated otherwise). The forecasting of remaining landfill capacity will be based on historical data and is not considered to materially affect the assessment.
- A lifecycle assessment (including embodied carbon and water) of materials has not been included, as the resources required to complete such an exercise are deemed disproportionate to the benefit they will offer the assessment of significance of effects.
- Furthermore, many of the elements assessed within a lifecycle assessment are not directly relevant to the purpose of this chapter. Embodied carbon (as part of a whole life carbon assessment) is assessed in **Chapter 12: Greenhouse Gases**.
- The impacts and effects associated with the extraction of raw resources and the manufacture of products have been excluded from the assessment as the Proposed Development does not involve or require direct extraction, processing and manufacture of raw resources for construction or operation.
- Landfill operators can claim commercial confidentiality for their data at the time of submission to the Environment Agency. Data for sites with a commercial confidentiality agreement in place are therefore unavailable for the baseline presented in this chapter.

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EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 16: Ground Conditions and Soils**

02-09-2026

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16. Ground Conditions and Soils

16.1 Introduction

- 16.1.1 This chapter considers the potential impacts of the Proposed Development on ground conditions and soils during the construction, operational and decommissioning phases. It sets out the proposed methodology for the ground conditions and soils assessment and identifies impacts that can be scoped out of the EIA.
- 16.1.2 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.

16.2 Consultation and Engagement

- 16.2.1 Engagement undertaken for the Combined Heat and Power (CHP) Phase 1 Town and Country Planning Application (TCPA) is summarised in **Table 16.1**. The engagement undertaken on CHP Phase 1 to date is relevant to the scoping of the Proposed Development as it has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the subsequent phase of the project.
- 16.2.2 Feedback in relation to this topic and the scope of works will be gained as part of the Proposed Development EIA Scoping Opinion, and this will inform the production of the Environmental Statement (ES).

Table 16.1 Consultation and engagement to date

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
Environment Agency	27 November 2024	Associated risks to controlled waters should be addressed by: - Following the risk management framework provided in the Land Contamination Risk Management (LCRM). - Referring to the Environment Agency guiding principles for land contamination. - Considering use of the National Quality Mark Scheme for Land Contamination Management.

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
		■ Referring to the gov.uk contaminated land pages for more information. ■ Referring to “The Environment Agency’s Approach to Groundwater Protection”. ■ All investigations of land potentially affected by contamination should be carried out by or under the direction of a suitably qualified competent person and in accordance with BS 10175 (2001, now updated to 2026) Code of practice for the investigation of potentially contaminated sites. ■ The Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice (version 2) should be referred to for determining whether or not excavated material arising from site during remediation and/or land development works is waste or has ceased to be waste.

16.3 Guidance

16.3.1 This chapter has, and when undertaking the assessment for the ES will, give consideration to the following guidance:

- Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (Defra, 2012);
- Land Contamination Risk Management (LCRM) (Environment Agency, 2020);
- Guidance for the Safe Development of Housing on Land Affected by Contamination National House Building Council (NHBC et al., 2008);
- The Contaminated Land: Applications in Real Environments (CL:AIRE) Framework for Assessing the Sustainability of Soil and Groundwater Remediation (CL:AIRE, 2010); and
- The CL:AIRE CAR-SOIL: Control of Asbestos Regulations 2012 - Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials (CL:AIRE, 2016).

16.4 Study Area

16.4.1 The Study Area comprises the Red Line Boundary as presented in **Volume 2, Figure 1.1: Site Location Plan**. The Study Area is divided into four main areas:

- Construction Area – where building or generators will be sited.
- Potential below ground cable routes/fuel lines – for trenching and cable installation.
- Construction compounds or laydown areas – temporary areas used during construction.
- Above ground cables/fuel lines (on existing gantries) and access roads.

16.4.2 The above areas are presented on **Figure 2: Site Areas** in the **Volume 3, Appendix 16.1: Preliminary Risk Assessment**.

Justification of Buffer

16.4.3 The Study Area will comprise the areas within the Red Line Boundary with a 250m buffer. This is considered appropriate based on the Proposed Development and related construction works, surrounding sensitive environmental receptors and potential contamination migration potential.

16.4.4 Given the size of the Study Area and different land uses, which in turn affect the different potentially viable pollutant linkages within the **Volume 3, Appendix 16.1: Preliminary Risk Assessment** the Study Area has been divided to better allow assessment. The Study Area will be assessed as a whole within this Scoping Chapter.

16.4.5 The Study Area 250m buffer is associated with potential groundwater contaminant migration and is also consistent with safe development on contaminated land guidance document R&D66 (NHBC *et al.*, 2008), when considering the impacts of contamination on sensitive environmental receptors.

16.5 Baseline Conditions

Existing Baseline

Geology

16.5.1 The Study Area is predominantly covered with hardstanding associated with its current use. Ground investigation undertaken for the CHP Phase 1 and reviewed as part of the **Volume 3, Appendix 16.1: Preliminary Risk Assessment** recorded general ground conditions of Made Ground of varying thicknesses,

underlain by superficial deposits of Alluvium and/ or Glacial Till in the central portion of the construction area, with bedrock recorded in all locations.

- 16.5.2 The laydown areas/ construction compounds are positioned on areas which could potentially be soft standing i.e. Made Ground directly at the surface. Made Ground would be expected underlying the hardstanding or at surface level and has been recorded up to 2.14m in thickness within the Stanlow Manufacturing Complex (SMC) (WSP, 2023).
- 16.5.3 The proposed laydown areas/ construction compounds and access roads/above ground cable routes as they extend towards the north of the Study Area are positioned in areas where superficial deposits are thicker with bedrock up to 4.50m bgl. Bedrock underlying the majority of the Study Area comprises the Chester Formation with some small areas of the Kinnerton Sandstone and the Wilmslow Sandstone underlying the access roads and laydown areas (WSP, 2023).

Hydrogeology

- 16.5.4 The Environment Agency's aquifer classifications (MAGIC Map) of the superficial and bedrock geology are summarised as follows:

Superficial

- Glacial Till – Secondary Undifferentiated Aquifer; and
- Tidal Flats - Secondary Undifferentiated Aquifer.

Bedrock

- Chester Formation – Principal Aquifer;
- Kinnerton Sandstone – Principal Aquifer; and,
- Wilmslow Sandstone – Principal Aquifer.

- 16.5.5 Groundwater is present within the bedrock aquifers and within the superficial deposits which could potentially be hydraulically connected to the surface water courses within the SMC (WSP, 2023). Several extraction boreholes (WSP, 2023) are present at the SMC, and the extraction volumes are known to affect the groundwater elevations and flow directions within the aquifer.

Hydrology

- 16.5.6 The following surface watercourses are located within Study Area and wider SMC:
- Gale Brook (culverted beneath the Study Area);
 - Thornton Brook (approximately 30m west of the Red Line Boundary (although one of the access roads comes within 100m of the Brook));

- River Gowy (approximately 80m west of the Red Line Boundary);
- Stanney Mill Brook (approximately 980m west of the Red Line Boundary);
- Manchester Ship Canal (approximately 600m north of the Red Line Boundary); and
- River Mersey (approximately 0.7km north of the Red Line Boundary).

Future Climate Change

Sea Level Rise/Flood Risk

- 16.5.7 The Study Area is currently located approximately 0.70km (from Red Line Boundary at its closest point) from the River Mersey (a tidal estuary of the Irish Sea) and is at an elevation approximately 8.50m AOD. Under RCP8.5 sea level along the coast in proximity to the Study Area is projected to rise by 1.05m by 2100, which could bring the River Estuary within approximately 730m of the Study Area during spring tides or storm surges.
- 16.5.8 The Study Area is partially located within a Flood Zone 3 indicating it is at a 1 in 100 years risk of flooding from rivers and the sea. Future climate change may result in changes to the frequency and magnitude of extreme weather events and associated flooding.

Projected Changes to Groundwater Level

- 16.5.9 The Study Area is located within the Wirral and West Cheshire Permo-Triassic Sandstone Aquifer groundwater catchment which falls under the WFD definition of a groundwater body. The eFLaG project far-future (2050-2079) projections for groundwater recharge within this catchment report a 0.2mm per day increase for the winter months for this groundwater body. No change to current recharge is indicated for other seasons. This indicates potential future increases in groundwater level, most likely during winter, relative to the current baseline.

Sensitive Land Uses

- 16.5.10 There are no Sites of Special Scientific Interest, Special Protection Areas, Special Areas of Conservation, Ramsar sites or National Nature Reserves located within the Study Area.

Mineral Resource Mapping

- 16.5.11 According to the British Geological Survey (BGS) mineral resource mapping (BGS, 2006), the Study Area is not in a designated mineral resource area.

Coal Mining

- 16.5.12 According to the Coal Authority Interactive Map viewer (Coal Authority, 2026), the Study Area does not lie within a Coal Mining Reporting Area.

Agricultural Soils

- 16.5.13 According to MAGIC Maps (2026), the majority of the Study Area is not designated under the Post-1988 Agricultural Land Classifications. Given the Study Area is predominantly hardstanding, it is likely to be classified as Industrial Land and will likely not have a designation.
- 16.5.14 An area in the northeast outside of the Site boundary, which is proposed for potential below ground cables, is located within an area of agricultural land. According to MAGIC Maps (2026) no designation exists for this land, however nearby land is a combination of Grade 3a and 3b, with 3a classified as best and most versatile (BMV). In lieu of the classification of the proposed below ground cable land it would be prudent to assume it is BMV soil. It is noted that there will be no permanent loss of these soils, based on a trenched method that is backfilled, so assessment will comprise soil management to prevent damage to the soil quality.

COMAH

- 16.5.15 The wider SMC is designated as a Control of Major Accident Hazards (COMAH) site. This means the SMC is regulated by the COMAH Competent Authority which in relation to ground conditions is the Environment Agency (EA). The EA will therefore be contacted as a statutory consultee.

Potential Contaminant Pathways and Receptors

- 16.5.16 The presence of contaminants within the ground has the potential to impact both human health and controlled waters related to sensitive receptors. The risk to sensitive environs will be quantified as part of the intrusive ground investigation works and associated risk assessment reporting.
- 16.5.17 The primary contaminant source to sensitive receptors pathways are summarised below:

Human Health

- Direct contact, soil ingestion and inhalation; and
- Migration and accumulation of ground gas in excavations/chambers and surrounding buildings and subsequent inhalation/asphyxiation by site preparation, earthworks, construction and building inhabitants.

Controlled Waters

- Infiltration of rainwater and leaching of contamination to shallow groundwater;
- Spillages from refuelling of contractor vehicles which migrate to shallow groundwater;
- Migration from groundwater into surface water bodies (Gale Brook); and
- Lateral and vertical leaching of contaminants into underlying aquifers.

Built Environment

- Accumulation of hazardous ground gas within pipeline service buildings i.e. serviceable chambers; and
- Degradation of below ground infrastructure due to direct contact with contaminated soils/groundwater.

Future Baseline

- 16.5.18 In the absence of the Proposed Development, there is potential for change to the baseline conditions with regard to soils and ground conditions as the Study Area is sited within the SMC and the adjacent land uses have the potential to impact the Study Area.
- 16.5.19 As discussed in **Section 16.5**, there is potential that sea level rises will decrease the distance between the Study Area and the Mersey Estuary. There is also potential that groundwater could become shallower as groundwater recharge increases over time.

16.6 Description of Likely Significant Effects

- 16.6.1 The presence of contaminants within the ground has the potential to impact both human health and controlled waters related to sensitive receptors. The risk to sensitive receptors will be quantified as part of the intrusive ground investigation survey, to be undertaken as part of the detailed design, and associated risk assessment reporting.

Construction Phase

- 16.6.2 Identified potential significant construction phase effects include the following:
- Potential mobilisation of contaminants during demolition of the current Study Area uses;
 - Exposing construction staff to contaminated dust and soil particulates during construction related earthworks activities;

- Mobilising existing contamination in groundwater as a result of ground disturbance and de-watering and creating preferential migration pathways for contaminants to reach sensitive controlled water receptors (e.g. Gale Brook); and
- Introduction of new sources of contamination to the ground, such as fuels and oils used in plant, associated with any spillages and leak.

Operational Phase

16.6.3 Identified potential significant operational phase effects include the following:

- Changes in Study Area (if proposed) levels may result in existing contaminants that were previously present at depth and therefore unlikely to interact with the identified receptors, now being present at the surface where they could pose unacceptable risks to future Study Area users; and
- Damage to any newly installed below ground cables and pipes from ground contaminants.

Scope

16.6.4 A summary of the proposed scope for the ground conditions and soils construction and operational phase assessments is presented in **Table 16.2**.

Table 16.2 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Contaminated dust and soil particulates posing risk to human health.	Construction	✓		Potential for construction staff to be exposed to contaminants in the ground posing potential human health related impacts.
	Operational		✓	Contaminated land pathways to human health to be addressed via a Remediation Strategy and incorporated as part of the construction phase, thereby leaving the Study Area 'suitable for use' from a contaminated land perspective as part of the operational phase.
Controlled water body contamination.	Construction	✓		Potential for contaminants to be mobilised and impact sensitive controlled water receptors. Potentially significant effects

Element	Phase	Scoped In	Scoped Out	Justification
	Operational		✓	subject to the mobility and contaminants concentrations. No contaminated land source-pathway-receptors linkage identified as part of the operational phase.
Hazardous gas accumulation in confine spaces.	Construction and Operational	✓		Potential for works to create additional pathways to allow hazardous gases to accumulate within newly installed service ducts and migrate towards buildings.
Agricultural Soils	Construction	✓		The soil within the agricultural fields that are proposed to potentially have below ground cables installed will be considered during the construction stage to maintain no loss of soil quality.
	Operational		✓	Post development there should be no permanent loss of soils.
Mineral Resources	Construction and Operational		✓	The Study Area does not lie within a Mineral Resource Protection area.
Built Environment	Construction		✓	Insufficient time for contaminants to impact in ground pipe/ducting materials during the construction phase of the Proposed Development.
	Operational	✓		Potential for contaminants in the ground to impact (damage) any newly installed in ground pipework or foundations.

16.7 Mitigation Measures

Construction Phase

16.7.1 It is anticipated that appropriate mitigation measures, including but not limited to the following, will be included in the register of environmental actions and

commitments (REAC) and delivered during the construction phase via the Code of Construction Practice (CoCP), which will be secured as part of the DCO requirements:

- 16.7.2 The following embedded mitigation measures would be included in the Outline Code of Construction Practice (CoCP) (this document will outline specific environmental controls):
- Earthworks would be completed in accordance with a compliant Materials Management Plan (MMP) to ensure reused material does not present a risk to human health or the environment and complies with UK waste legislation regulations. The MMP would be produced as part of the detailed design of the Proposed Development.
 - Construction workers to wear appropriate Personal Protective Equipment (PPE), where required, to mitigate the potential risk of exposure to contaminated soils and to remove PPE and wash hands prior to eating or drinking.
 - Incorporation of a temporary surface water drainage strategy to limit any contaminated run-off entering surrounding surface watercourses and permanent surface water drainage at any new permanent structures.
 - Subject to the findings of the intrusive ground investigation, to be undertaken as part of the detailed design, if required a suitable Remediation Strategy will be developed and agreed with Cheshire West and Cheshire Council and the Environment Agency prior to being implemented to mitigate unacceptable contaminated land related risks in the context of the Study Area.
 - Appropriate measures to limit release of contamination sources to the ground from construction related plant/machinery and storage of materials to be incorporated within a CoCP.

Operational Phase

- 16.7.3 To mitigate any potential operation effects, the proposed future use will include embedded mitigation such as appropriate permanent drainage design to reduce contamination migrating to the underlying ground or sensitive watercourses.

16.8 Assessment Methodology

- 16.8.1 The generic approach to the assessment methodology is set out in **Chapter 3: Approach to EIA**, has informed the approach used in this assessment. The methodology used for assessing effects associated with soils and ground conditions is set out in the remainder of this section.

- 16.8.2 The technical framework of assessing and managing land contamination risk, as set out in the Environment Agency guidance LCRM (Environment Agency, 2025) will be followed. The assessment of risks from land contamination is based upon the production of a Conceptual Site Model including the identification and subsequent appraisal of contaminant linkages, which are specifically relevant to the project under consideration. A contaminant linkage requires the presence of:
- A source of contamination;
 - A receptor capable of being adversely affected by the contamination; and
 - An active pathway capable of exposing a receptor to the contaminant.
- 16.8.3 The risk assessment process for the Proposed Development will address the significance of each relevant contaminant linkage, noting that the designation of risk is based upon the consideration of:
- The magnitude of the potential consequence (severity) – taking into account both the potential severity of the hazard and the sensitivity of the receptor; and
 - The magnitude of probability (likelihood) – taking into account both the presence of the hazard and receptor and the potential for a pathway to be realised between them.
- 16.8.4 The definitions for the qualitative risk assessment have been taken from the Guidance for the Safe Development of Housing on Land Affected by Contamination (NHBC *et al.*, 2008). The likelihood classifications for the contaminant linkages being realised is presented in **Table 16.3**.

Table 16.3 Likelihood classification of contaminant linkage being realised

Classification	Definition	Examples
High Likelihood	There is a contaminant linkage and an event would appear very likely in the short term and almost inevitable over the long term. Or there is evidence at the receptor of harm or pollution.	a) Elevated concentrations of toxic contaminants are present in soils in the top 0.5m of ground where direct contact is possible. b) Ground/groundwater contamination could be present from chemical works, containing a number of Underground Storage Tanks (USTs).
Likely	There is a contaminant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not	a) Elevated concentrations of toxic contaminants are present in soils at depths of 0.5m - 1.0m where direct contact is possible, or the top 0.5m of ground where direct contact is not possible.

Classification	Definition	Examples
	inevitable, but possible in the short term and likely over the long term.	b) Ground/groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.
Low Likelihood	There is a contaminant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place and is less likely in the shorter term.	a) Elevated concentrations of toxic contaminants are present in soils at depths >1m where direct contact is possible, or 0.5m - 1.0m of ground where direct contact is not possible. b) Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage.
Unlikely	There is a contaminant linkage, but circumstances are such that it is improbable that an event would occur even in the very long term.	a) Elevated concentrations of toxic contaminants are present below hard standing. b) Light industrial unit <10 years old containing a double skinned UST with annual integrity testing results available.

16.8.5 The assessment of the magnitude of a potential consequence of a contaminant linkage will take into account the sensitivity of a given receptor to a particular source or contaminant of concern. The assessment will take into account the full exposure via the relevant linkage. The classification of consequence is presented in **Table 16.4**.

Table 16.4 Classification of consequence

Classification	Human Health	Controlled Water	Geodiversity	Property/ Structures/ Crops and Animals	Examples
Severe	Highly elevated concentration is likely to result in “significant harm” to human health as defined by the Environmental Protection Act (EPA) 1990, Part 2A, if exposure occurs.	Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.	Major damage to a geodiversity site, which is likely to result in a substantial adverse change in its functioning or harm to a site of special interest that endangers the long-term maintenance of the site.	Catastrophic damage to crops, buildings or property.	Significant harm to humans is defined in the Contaminated Land Statutory Guidance as death, life threatening diseases (for example, cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions. Major fish kill in surface water from large spillage of contaminants from Site. Highly elevated concentrations of Hazardous or priority substances present in groundwater close to small potable abstraction (high sensitivity). Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).

Classification	Human Health	Controlled Water	Geodiversity	Property/ Structures/ Crops and Animals	Examples
Medium	Elevated concentrations which could result in “significant harm” to human health as defined by the EPA 1990, Part 2A if exposure occurs.	Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.	Significant damage to a geodiversity site, which may result in a substantial adverse change in its functioning or harm to a site of special interest that may endanger the long term maintenance of the site.	Significant damage to crops, buildings or property.	Significant harm to humans is defined in the Contaminated Land Statutory Guidance as death, life threatening diseases (for example, cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions. Damage to building rendering it unsafe to occupy, for example, foundation damage resulting in instability. Ingress of contaminants through plastic potable water pipes.
Mild	Exposure to human health unlikely to lead to “significant harm”.	Equivalent to EA Category 3 pollution incident including minimal or short-lived effect on water quality; marginal effect on amenity value, agriculture or commerce.	Minor or short-lived damage to a geodiversity site, which is unlikely to result in a substantial adverse change in its functioning or	Minor damage to crops, buildings or property.	Exposure could lead to slight short term effects (for example, mild skin rash). Surface spalling of concrete.

Classification	Human Health	Controlled Water	Geodiversity	Property/ Structures/ Crops and Animals	Examples
			harm to a site of special interest that would endanger the long term maintenance of the site.		
Minor	No measurable effects on humans.	Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.	Equivalent to insubstantial pollution incident with no observed effect on a geodiversity site or site of special interest.	Repairable effects of damage to buildings, structures.	The loss of plants in a landscaping scheme. Discoloration of concrete.

16.8.6 The risk matrix which links the likelihood and consequence with respect to the EIA for the Proposed Development is shown in **Table 16.5**.

Table 16.5 Risk matrix

		Likelihood			
		Unlikely	Low	Likely	High
Potential Consequence	Severe	Moderate/Low	Moderate	High	Very High
	Medium	Low	Moderate/Low	Moderate	High
	Mild	Very Low	Low	Moderate/Low	Moderate
	Minor	Very Low	Very Low	Low	Low

16.8.7 The relevant risk definitions are summarised in **Table 16.6**.

Table 16.6 Risk definitions

Risk	Definition
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the Site without remediation action or there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to the Site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short term.
High	Harm is likely to arise to a designated receptor from an identified hazard at the Site without remediation action. Realisation of the risk is likely to present a substantial liability to the Site owner or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner or occupier. Some remediation works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst that this harm if realised would normally be

Risk	Definition
	mild. It is unlikely that the Site owner or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.
Very Low	It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

Significance Criteria

- 16.8.8 There is no established guidance on how to use the LCRM risk assessment approach as the basis for the evaluation of the significance of effects within the EIA process.
- 16.8.9 The methodology to be used in the assessment will, therefore, use professional judgment, evaluating the change in risk from baseline conditions to those during and following the Proposed Development. In order to define the baseline risk, the initial assessment and classification of risk is carried out for the Study Area in its pre-development state. A separate assessment of risk is then conducted for the Study Area post-development (including environmental measures inherently embedded in the development) to enable an evaluation of the change in risk due to the Proposed Development, as shown in **Table 16.7**.
- 16.8.10 In considering the post-development risks, embedded environmental measures will be taken into account.

Table 16.7 Risk classification

Risk post-development (including embedded environmental measures)								
			Very Low	Low	Moderate/Low	Moderate	High	Very High
Risk Pre-development	Existing Receptors	Very High	Major Positive. (Significant)	Major Positive. (Significant)	Moderate Positive. (Potentially Significant)	Moderate Positive. (Potentially Significant)	Minor Positive. (Not Significant)	Negligible. (Not Significant)
		High	Major Positive. (Significant)	Moderate Positive. (Potentially Significant)	Moderate Positive. (Potentially Significant)	Minor Positive. (Not Significant)	Negligible. (Not Significant)	Minor Negative. (Not Significant)
		Moderate	Moderate Positive. (Potentially Significant)	Moderate Positive. (Potentially Significant)	Minor Positive. (Not Significant)	Negligible. (Not Significant)	Minor Negative. (Not Significant)	Moderate Negative. (Potentially Significant)
		Moderate / Low	Moderate Positive. (Potentially Significant)	Minor Positive. (Not Significant)	Negligible. (Not Significant)	Minor Negative. (Not Significant)	Moderate Negative. (Potentially Significant)	Moderate Negative. (Potentially Significant)
		Low	Minor Positive. (Not Significant)	Negligible. (Not Significant)	Minor Negative. (Not Significant)	Moderate Negative. (Potentially Significant)	Moderate Negative. (Potentially Significant)	Major Negative. (Significant)

Risk post-development (including embedded environmental measures)								
		Very Low	Negligible. (Not Significant)	Minor Negative. (Not Significant)	Moderate Negative. (Potentially Significant)	Moderate Negative. (Potentially Significant)	Major Negative. (Significant)	Major Negative. (Significant)
	No Receptor Present	N/A	Minor Negative. (Not Significant)	Moderate Negative. (Potentially Significant)	Moderate Negative. (Potentially Significant)	Major Negative. (Significant)	Major Negative. (Significant)	Major Negative. (Significant)

16.9 Assumptions and Limitations

16.9.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The assessment will rely on available data (e.g. obtained from desk study, site investigation, groundwater monitoring and gas monitoring), and reasonable endeavours will be made to ensure that the data is accurate and up to date. However, the accuracy of third-party information cannot be confirmed.
- Assessments will be limited by availability of design information, specifically in relation to site levelling, ground excavations and below ground structures (i.e. depth and type of foundations, finished levels).

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EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 17: Transport and Movement**

02-09-2026

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17. Transport and Movement

17.1 Introduction

- 17.1.1 The Traffic and Movement assessment will consider the potential significant effects of the Proposed Development on traffic and movement during the construction, operational and decommissioning phases. It defines the scope of the transport assessment to be undertaken as part of the Environmental Statement (ES) and identifies matters that can be reasonably scoped out.
- 17.1.2 This chapter of the Scoping Report sets out the relevant legislation, planning policy context and technical guidance used to inform the assessment and summarises any consultation and engagement in relation to Traffic and Transport undertaken to date. It provides an overview of the baseline conditions relevant to Traffic and Transport, the measures that will be incorporated into the Proposed Development to mitigate Traffic and Transport effects, the likely significant effects to be considered within the assessment, and how these likely significant effects will be assessed for the purpose of an Environmental Impact Assessment (EIA).
- 17.1.3 This chapter should be read in conjunction with **Chapter 2: The Proposed Development**, and given the interface with other aspects of the Project, considered alongside:
- **Chapter 6: Noise and Vibration;**
 - **Chapter 5: Air Quality;**
 - **Chapter 7: Biodiversity;**
 - **Chapter 13: Socio-economics; and**
 - **Chapter 14: Population and Human Health.**
- 17.1.4 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations.**

17.2 Proposed Development in Context of Traffic

- 17.2.1 The component elements of the Proposed Development are described in **Chapter 2: The Proposed Development**). The Proposed Development is located immediately adjacent to the Combined Heat and Power (CHP) Phase 1 development and will utilise the same principal access points, construction routes, and surrounding highway network. A planning application for CHP Phase 1 has been submitted to the local planning authority and has been subject to

assessment within Chapter 15: Traffic and Movement (Volume 1) of the associated Environmental Statement (ES) (November 2025), supported by a comprehensive Transport Assessment (Document reference: Appendix 15-1: Transport Assessment (Volume 3)). The conclusions of that assessment provide a robust and proportionate evidence base for Scoping decisions for the Proposed Development.

- 17.2.2 The ES for the Proposed Development will be supported by a Transport Assessment (TA), alongside other technical supporting documents, proportionate to the scale and nature of the development and informed, partially by the CHP Phase 1 methodology, baseline data and findings and information provided by the Applicant.
- 17.2.3 The Proposed Development will be located within an established industrial environment and will utilise existing access arrangements and internal highway infrastructure within the SMC.
- 17.2.4 The Proposed Development will be constructed primarily using modular construction techniques, with major plant components manufactured off-site and transported to the Site for installation. Temporary construction features will include laydown areas, contractors' welfare and temporary construction parking, together with limited demolition of existing redundant infrastructure within the Site to facilitate construction.
- 17.2.5 The construction programme is anticipated to commence in quarter 4 2028 (subject to development consent being granted), with an estimated 16-month construction programme. Construction activities will be delivered through a series of phased stages, including site mobilisation and early works, earthworks and civil works, installation and mechanical completion, and commissioning (see **Chapter 2: The Proposed Development** for further details). Construction traffic volumes will vary across the programme, with peak movements anticipated during the principal installation phase when delivery of plant and workforce levels are highest.
- 17.2.6 Construction working hours are anticipated to be Monday to Friday between 08:00 and 18:00, and on Saturdays between 08:00 and 13:00, with no construction activity on Sundays or Bank Holidays. Start-up and shutdown activities may occur within a one-hour window either side of these standard working hours. Construction vehicle movements will be associated primarily with the construction workforce, delivery of materials and modular plant, and a limited number of abnormal indivisible loads. Heavy Goods Vehicle (HGV) deliveries are anticipated to be distributed across the standard working day. Construction staff and standard HGVs will access the Site primarily via existing routes from the Strategic Road Network, while abnormal loads will utilise the established secondary access arrangements where required.

- 17.2.7 Following completion of construction, the Proposed Development will operate on a continuous 24-hour basis, with shift-based staffing operating 12-hour shifts commencing at 07:00 and 19:00. Day-working staff will be present Monday to Friday between 08:00 and 18:00 only. Total operational staffing is anticipated to be approximately 35–40 personnel, comprising 18 shift staff and the remainder as day-working staff. Operational traffic will therefore largely reflect regular staff travel patterns associated with shift changeovers and weekday day-working activity.
- 17.2.8 Operational vehicle movements associated with the Proposed Development are expected to be limited in nature and consistent with existing site operation. Car travel will be generated by operational staff only, with no regular weekend activity outside of planned turnaround events. Operational HGV and LGV movements will be routine and generally confined to weekday daytime hours (08:00–18:00, Monday to Friday), with minimal weekend deliveries. On this basis, operational demand is anticipated to comprise approximately one HGV movement per working day associated with chemical or spare parts deliveries, together with up to two LGV movements per day. Preferred strategic freight routes serving the Site include connections via North Wales, the Port of Dover and the Port of Hull.
- 17.2.9 As the Proposed Development will replace existing CHP capacity within the SMC as older plant is retired, operational traffic levels are anticipated to broadly reflect existing baseline conditions. There is not expected to be a material increase in external deliveries or staff movements during the operational phase. Consequently, any potential traffic and transport effects are anticipated to arise primarily during the temporary construction phase, with limited relevance to long-term operational traffic conditions.
- 17.2.10 For context, CHP Phase 1 construction was forecast to commence in August 2026 and conclude in July 2028, with peak activity occurring during 2027. This may see delay following planning discussions with the local highway authority and statutory consultees that were concluded in August 2026. The Proposed Development construction mobilisation is anticipated to commence in quarter 4 2028 and be in Q1 of 2030. While there will be a short period of overlap between the two construction programmes including accounting for the delay to CHP Phase 1's programme, the respective peak construction periods are not expected to coincide, thereby limiting cumulative construction traffic effects.

17.3 Consultation and Engagement

- 17.3.1 Whilst no consultation has taken place to date on the Proposed Development, engagement with the relevant statutory stakeholders is to be undertaken, including with Cheshire West and Chester Council (CWCC) and National Highways. These discussions will aim to discuss the following key issues:

- Scope of the assessment;
- Proposed traffic growth to future year;
- Committed highways schemes that may affect the future baseline;
- Committed development that may affect the future baseline;
- Availability of existing traffic data and data collection techniques;
- Potential traffic generation;
- Management of traffic impacts on the public rights of way (PRoW) network; and
- Management of traffic impacts on the highway network including HGV management.

- 17.3.2 An introductory briefing meeting with National Highways was held in May 2026 in relation to the Proposed Development. The May 2026 meeting and engagement undertaken for CHP Phase 1 of the CHP development is summarised in **Table 17.1**.
- 17.3.3 The engagement undertaken on CHP Phase 1 to date is relevant to the Scoping of the Proposed Development as it has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the Proposed Development.
- 17.3.4 These shared sensitivities and details include the following:
- Assessment of sensitive SRN junctions highlighted by National Highways (Junction 14 of the M56 and Junction 10 of the M53); and
 - Scoping operational phase traffic out of the assessment due to the forecasted negligible impacts.
- 17.3.5 Feedback in relation to this topic and the scope of works will be gained as part of the Proposed Development EIA Scoping Opinion, and this will inform the production of the ES.

Table 17.1 Consultation and engagement to date

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
National Highways	21 May 2026	Introductory briefing for the Proposed Development: EET provided an overview of the SMC Site and the Proposed Development. The route to consent, the delivery timescales, and the approach to Scoping were discussed.

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
CWCC	11 March 2025	CWCC provided a response to the Technical Scoping Study for CHP Phase 1 (in a separate planning application) submitted to the highways officer on 1 November 2024, recommending that the future baseline assessment year be revised to 2026 and that a percentage impact assessment be undertaken to evaluate temporary impacts on the local highway network during the construction phase. The future baseline assessment year has since moved to 2027 to coincide with the peak of construction and a percentage impact assessment has been undertaken for the daily vehicle movements and peak hour. The reasons for this and the percentage impact assessment are set out the associated CHP Phase 1 ES Chapter and the accompanying Appendix 15-1: Transport Assessment (Volume 3).
		Operational Phase: CWCC highways provided a response to the EIA Scoping Report within a letter dated 24 January 2025. The response noted the conclusions of the table within the EIA, which stated that the operational phase of CHP Phase 1 is to be scoped out due to no changes in operational staff onsite. CWCC agreed that operational staff can be scoped out of the assessment.
		Construction Phase: The Scoping note (issued on 31 October 2024) identified that construction was anticipated to commence in 2025 and run for approximately 12 months. A technical response from CWCC was subsequently received on 11 March 2025. The construction programme has since been revised, with commencement now proposed for August 2026. Accordingly, the construction phase year has been updated to 2027 to reflect this revised programme.
National Highways	6 November 2024	National Highways issued a response to the Technical Scoping Study for CHP Phase 1, submitted on 1 November 2024, requesting additional information regarding the travel patterns of construction personnel, including modes of transport and home locations, to assess potential impacts on the Strategic Road Network (SRN), specifically at M56 Junction 14 and M53 Junction 10. The methodology and key traffic and movement parameters was set out in the associated CHP Phase 1 ES Chapter and the accompanying Appendix 15-1: Transport Assessment (Volume 3).

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
CWCC	20 June 2024	CWCC confirmed acceptance for traffic surveys to be conducted and completed by Friday, 19 July 2024, in advance of the final day of the summer school term on Wednesday, 24 July 2024.

17.4 Guidance

- 17.4.1 As the development constitutes a Nationally Significant Infrastructure Project (NSIP) requiring development consent under the Planning Act 2008, the Scoping of transport effects is informed by Planning Inspectorate (PINS) guidance, National Policy Statements (NPSs) and legislation applicable to Development Consent Order (DCO) applications.
- 17.4.2 All relevant legislation has been considered in the preparation of this chapter. The EIA will also consider all relevant legislation set out in **Table 17.2**.

Table 17.2 Technical Guidance relevant to Traffic and Transport

Technical Guidance Document	Context	Sections Considered
Environmental Assessment of Traffic and Movement (IEMA, 2023)	Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management & Assessment (IEMA)) Environmental Assessment of Traffic and Movement (EATM) guidelines provide practitioners with good practice advice on how to carry out the assessment of traffic and movement of people as part of a statutory EIA or non-statutory environmental assessment.	Section 13.7
Planning Practice Guidance Travel Plans, Transport Assessments and Statements (Ministry of Housing, Communities & Local Government, 2014)	This Planning Practice Guidance (PPG) was published in March 2014. Together, PPGs and the NPPF set out what the Government expects of local authorities. The overall aim is to ensure the planning system allows land to be used for new homes and jobs, while protecting valuable natural and historic environments. The guidance includes specific details in relation to the preparation of a TA, Transport Statement (TS) and Travel Plan (TP).	Section 13.7

Technical Guidance Document	Context	Sections Considered
LA 101 - Introduction to environmental assessment (National Highways, 2019)	LA 101 sets out the over-arching requirements and principles that form an introduction to the environmental assessment of motorway and all-purpose trunk roads.	Section 13.7
LA 103 - Scoping projects for environmental assessment (National Highways, 2020a)	This document sets out the requirements for scoping motorway and all-purpose trunk road projects for environmental assessment.	Section 13.7
LA 104 - Environmental assessment and monitoring (National Highways, 2020b)	This document sets out the requirements for environmental assessment of projects, including reporting and monitoring of significant adverse environmental effects.	Section 13.7
LA 112 - Population and Human Health, Design Manual for Roads and Bridges (National Highways, 2020)	This document sets out the requirements for assessing and reporting the environmental effects on population and health from construction, operation, and maintenance of highways projects.	Section 13.7

17.4.3 A summary of the key legislation considered, but not limited to, in the scope of Traffic and Transport effects is outlined in **Table 17.3**.

Table 17.3 Legislation relevant to Traffic and Transport

Legislation	Legislative Context
The Highways Act (1980)	The Highways Act 1980 sets out the requirements pertaining to delivering highways infrastructure, managing existing highways and managing highway activity including off site highway works, for example, the creation of temporary site access.
Town and Country Planning Act (1990)	The Town and Country Planning Act 1990 provides the legal framework for the town and country planning system in England and Wales.
New Roads and Street Works Act (1991)	The New Roads and Street Works Act 1991 provides a legislative framework for street works by undertakers and works for road purposes to the extent that these must be coordinated by street authorities.
Traffic Management Act (2004)	The Traffic Management Act 2004 provides powers to tackle congestion and disruption on the road network and requires local authorities, where possible, to ensure that traffic can move quickly and freely on their roads.

Legislation	Legislative Context
The Planning Act (2008)	The Planning Act 2008 created a new development consent regime for major infrastructure projects in the fields of energy, transport, water, wastewater, and waste. It was intended to speed up the process for approving major new infrastructure projects.
Infrastructure Planning (Environmental Impact Assessment) Regulations (2017)	UK legislation that sets out the requirements for assessing and mitigating the environmental impacts of major infrastructure projects. The regulations require developers to prepare an EIA and consult with stakeholders and the public. The aim of the regulations is to ensure that the environmental impacts of major projects are fully assessed and addressed, and that sustainable development principles are followed.

17.5 Study Area

- 17.5.1 The forecasted temporary traffic impact associated with the Proposed Development is similar to CHP Phase 1. Consequently, the Proposed Development Study Area reflects that used for CHP Phase 1 and includes the same local and strategic network, which has capacity to accommodate temporary construction traffic:
- 17.5.2 Junctions included:
- SMC / Pool Lane access (Gate 6);
 - Pool Lane / Link Road roundabout;
 - Pool Lane / Oil Sites Road roundabout;
 - Pool Lane / A5117 / B5132 signalised junction;
 - A5117 / Ince Lane signalised junction;
 - A5117 / Thornton Green Lane priority junction;
 - M56 Junction 14 (Hapsford Interchange); and
 - M53 Junction 10 (Stanlow Halt Interchange).
- 17.5.3 This Study Area was previously agreed with CWCC and National Highways for CHP Phase 1 and was demonstrated to capture all links where construction traffic changes exceeded EATM screening thresholds.
- 17.5.4 The identified junction and connecting links within the Study Area are highlighted on the plan at **Volume 2, Figure 17.3: Stanlow CHP Phase 2 Traffic and Transport Study Area**.
- 17.5.5 The Study Area includes the primary transport and highway links from the Proposed Development to the surrounding local and SRN that would likely be

subject to daily traffic flow changes because of the construction and operation of the Proposed Development.

- 17.5.6 The Study Area will be refined based upon ‘Rule 1’ and ‘Rule 2’ of the EATM1 Guidelines which can be used to determine the effect of increased traffic volumes on links within the Study Area, as described below:
- Rule 1: Include highway links where traffic flows (or HGV flows) are predicted to increase by more than 30%; and
 - Rule 2: Include any other specifically sensitive areas where traffic flows (or HGV flows) are predicted to increase by 10% or more.
- 17.5.7 The extent of the Study Area will be subject to pre-application discussions with CWCC and National Highways.

17.6 Baseline Conditions

Traffic Data Sources

- 17.6.1 Baseline conditions for the Proposed Development will, where appropriate, reuse or update the 2024 baseline dataset established for CHP Phase 1, including:
- **Desk study review** to establish existing:
 - pedestrian and cycle routes from Ordnance Survey (OS) (OS, n.d.), PRoW definitive maps (CWCC, n.d.), Cheshire West and Chester cycle maps¹⁶, Sustrans National Cycle Network Map (Sustrans, n.d.);
 - bus services and associated infrastructure; and
 - highway network characteristics, including highways safety records and Google traffic data, and Personal Injury Collision (PIC) data to be obtained from CWCC as the Local Highways Authority (LHA).
 - **Survey data:**
 - Non-motorised user data – onsite observations have been undertaken to assess the level of non-motorised user activity within the Study Area.
 - **Traffic data:**
 - Traffic volumes- Junction turning counts at junctions within the Study Area within the local road network during 2024 for a 24-hour period on a weekday. JTC surveys are available for:
 - Junction 1 - SMC/Pool Lane priority junction;
 - Junction 2 - Pool Lane/Link Road roundabout;

- Junction 3 - Pool Lane/Oil Sites Road roundabout;
- Junction 4 - Pool Lane/A5117/B5132 signalised junction;
- Junction 5 - A5117/Ince Lane signalised junction;
- Junction 6- M56 Junction 14 Hapsford Interchange roundabout.
- Junction 7 - A5117/Thornton Green Lane priority junction; and
- Junction 8- M53 Junction 10 Stanlow Halt Interchange roundabout.
- It is noted that 2024 observed traffic flow data is available for Junction 6 (M56 Junction 14) and Junction 8 (M53 Junction 10) from Frodsham Solar Farm TA (PINS case reference: EN010153). Automatic Traffic Counts (ATC) on selected connecting highway links during 2024 for one week. ATC surveys are available for:
 - Link 2 - Pool Lane between Link Road and Oil Sites Road;
 - Link 6a/Link 6b - A5117 between Pool Lane and Ince Lane;
 - Link 12 - A5117 between Pool Lane and Thornton Green Lane; and
 - Link 13 - A5117 between Thornton Green Lane and M53 Junction 10.
- National Highways WebTRIS18 Data for selected links on the Strategic Road Network (SRN); and
- Cumulative Developments 2024 traffic flows are utilised including:
 - Annual Average Daily Traffic (AADT) and peak-hour flows from the Frodsham Solar Farm Transport Assessment (PINS case reference: EN010153) for selected links on the Strategic Road Network (SRN); and
 - AADT and peak-hour flows from the Environmental Statement (Volume III), Appendix 16.2: Transport Assessment – Runcorn Carbon Dioxide Spur Pipeline, Proposed Development (Protos West AGI Spur Pipeline).

- 17.6.2 The CHP Phase 1 ES concluded that July 2024 surveys were representative despite background construction activity across the wider Protos site (a separate nearby site from where traffic survey data was extracted from its respective planning application), providing a realistic worst-case baseline for cumulative build out.
- 17.6.3 Contemporary Personal Injury Collision (PIC) data (Crashmap or STATS19) will be collected for the latest 5-year period available. The traffic and movement baseline for the Proposed Development will be derived primarily from traffic survey data collected in 2024, supplemented by updated collision records and background growth factors where necessary. This approach is considered robust,

proportionate, and appropriate for the purposes of assessment, particularly given the context of the Proposed Development and the wider SMC.

17.6.4 The suitability of the 2024 baseline is supported by the following factors:

- the nature of land use and transport activity within and surrounding the SMC is predominantly industrial and has remained functionally stable over recent years;
- traffic and movement assessments undertaken for CHP Phase 1, using the same baseline year, were accepted by CWCC and National Highways, including through the EIA Scoping Opinion issued in January 2025; and
- traffic conditions in 2024 already reflect background construction activity across the wider Protos and Stanlow sites, thereby representing a realistic and conservative ‘worst case’ baseline rather than an artificially low demand scenario.

Representativeness of 2024 Traffic Conditions

17.6.5 The 2024 traffic surveys were undertaken during neutral weekday periods and captured:

- typical operational traffic associated with the functioning SMC; and
- ongoing background construction traffic associated with committed developments within the wider Protos Resource Recovery Park and Stanlow area.

17.6.6 As confirmed in the CHP Phase 1 ES and TA, the inclusion of background construction activity within the baseline is appropriate given that:

- the wider Stanlow and Protos areas are subject to long term phased build out, with multiple plots under construction at any given time;
- it is not possible, nor proportionate, to “strip out” construction activity in an area where such activity is a defining and persistent land use characteristic; and
- for EIA purposes, this provides a conservative proxy for future baseline conditions, avoiding reliance on speculative assumptions regarding the timing or scale of other developments.

17.6.7 On this basis, the 2024 baseline does not under represent traffic demand and is therefore suitable for informing both Scoping and subsequent impact assessment.

Consistency with EATM and DMRB Guidance

- 17.6.8 Given that the Proposed Development is located adjacent to CHP Phase 1, served by identical access points, of comparable scale and construction profile and proposed within the same long-established industrial context, there is no substantive justification for adopting alternative traffic flow data.
- 17.6.9 The approach is fully aligned with:
- IEMA Environmental Assessment of Traffic and Movement (EATM) guidance, which emphasises proportionality and the use of representative baseline conditions rather than continual survey refresh where changes are marginal; and
 - DMRB LA 103 (National Highways, 2020a) and LA 104 (National Highways, 2020b), which recognise that baseline datasets may be reused where:
 - network conditions are not subject to material change; and
 - any forecast differences can be robustly addressed through growth and scenario testing.
- 17.6.10 For the Proposed Development, any temporal difference between the 2024 observed year and the submission year will be explicitly addressed through:
- application of TEMPro / NTEM traffic growth factors to derive a future baseline scenario;
 - inclusion of relevant committed developments within cumulative assessment scenarios if required; and
 - percentage change-based screening, consistent with CHP Phase 1 and EATM Rules 1 and 2.

Existing Baseline

Site Context

- 17.6.11 The Site is situated in an area that is characterised by industrial uses. The Site is in north Cheshire approximately 9.5km to the north of Chester and approximately 700m south of the Manchester Ship Canal and Mersey Estuary. Ellesmere Port is located approximately 4km to the west of the Site. Locally, the Site is situated between two Strategic Road Network (SRN) junctions, namely M53 Junction 10, to the east, and M56 Junction 14, to the west. Immediately to the east of the Proposed Development lies the village of Elton. The Site is located within the SMC is positioned adjacent to the existing CHP Facility.

- 17.6.12 Refer to **Chapter 2: The Proposed Development** for more granular detail on the development proposals.
- 17.6.13 Primary access to the Site is via the main SMC entrance at Gate 6 on Pool Lane, with onward movement provided by the internal SMC road network. The access is via a signalised junction and serves parking areas, pipelines and storage facilities. The carriageway provides two inbound and two outbound lanes, is approximately 14 metres (m) wide, and is suitable for all vehicle types, including HGVs. A gatehouse and security barrier is located approximately 200m from the Pool Lane junction. Gate 6 will be used by construction staff and for HGV deliveries, with HGVs required to wait within the SMC at the designated Staging Yard prior to entering the Site.
- 17.6.14 A secondary access into the SMC is provided from the A5117 via the Letters Inn Entrance, located approximately 150m east of Thornton Green Lane. This access will be used for Abnormal Indivisible Loads (AILs) approaching from the A5117. The Letters Inn Entrance is approximately 25m wide and benefits from dropped kerbs to accommodate large vehicles.

Highway Network

- 17.6.15 South of the main Site access, Pool Lane connects with the A5117 and B5132 at a signalised crossroads. Pool Lane runs north to south and operates as a dual carriageway for approximately 500m between the A5117 and a roundabout which also serves Link Road towards the village of Elton. This section of Pool Lane is subject to a 50mph speed limit and includes a narrow footway on the northbound side. Beyond the roundabout, Pool Lane continues as a single carriageway, providing access to the Site and neighbouring businesses within Thornton Technology Park.
- 17.6.16 The A5117 runs east–west and provides access to the Strategic Road Network (SRN), linking to M56 Junction 14 to the east and M53 Junction 10 to the west. East of Pool Lane, the A5117 operates as a dual carriageway between the Pool Lane/B5132 junction and M56 Junction 14, with two lanes in each direction and subject to the National Speed Limit. A shared footway/cycleway is provided along the northern and western side. This section includes several junctions serving Elton village and local residential and commercial properties.
- 17.6.17 To the west of Pool Lane, the A5117 narrows to a single carriageway and remains subject to the National Speed Limit. A continuous shared footway/cycleway is provided on the northern side, with on-road cycle lanes on both sides of the carriageway. This section of the route serves a number of commercial premises and provides access to the village of Thornton-le-Moors.

- 17.6.18 Construction traffic will primarily access the Site from the SRN via the A5117, typically from M56 Junction 14 depending on the origin of deliveries. At this stage, it is anticipated that construction materials and equipment will be delivered directly to the Site via the existing Pool Lane access, which is identified as the preferred route. There are no height or weight restrictions along this route, and it is suitable for all legal vehicle types.

Strategic Road Network Infrastructure

- 17.6.19 **Hapsford Interchange:** M56 Junction 14, known as the Hapsford Interchange, is a grade-separated roundabout interchange where the M56 motorway intersects the A5117. It offers full access in all movement directions and includes a motorway service area. The adjacent A5117 connects the junction to the site, as a dual carriageway—but east of the junction it becomes single carriageway toward Helsby/A56.
- 17.6.20 **Stanlow Halt Interchange:** M53 Junction 10 is a grade-separated roundabout interchange linking the M53 motorway with the A5117. Known as the Stanlow Halt Interchange, it serves as a crucial connection for traffic moving between Ellesmere Port, Chester, and nearby areas. The M53 at this junction runs north–south, providing northbound access toward Birkenhead and the Kingsway Tunnel, and southbound access toward Chester and the M56.
- 17.6.21 **A5117:** The A5117 functions as a primary east–west route with dual carriageway sections approaching the junction. To the west, it continues toward Ellesmere Port and its industrial zones, while to the east it connects with Pool Lane and onward to the M56 at Junction 14. The roundabout features multiple arms that link the M53 motorway diverge facilities with the A5117.

Walking and Cycling (Active Travel Network)

- 17.6.22 A number of designated public rights of way (PRoW) are located within 500m of the Proposed Development, including:
- Thornton-le-Moors Footpath 1 (approximately 200m south of the Site);
 - Thornton-le-Moors Footpath 2 (approximately 220m south of the Site);
 - Thornton-le-Moors Footpath 3 (approximately 380m south of the Site);
 - Elton Footpath 1 (approximately 7m east of the Site); and
 - Elton Footpath 5 (approximately 200m south of the Site).
- 17.6.23 National Cycle Network (NCN) Route 5 runs immediately south of the Site along the A5117. The route operates primarily as an on-road cycle facility, with dedicated cycle lanes provided along sections of the carriageway. Along the

eastbound side of the A5117, the footway also functions as a shared footway/cycleway, as shown on **Volume 2, Figure 2.1: Environmental Constraints Plan**. NCN Route 5 is a long-distance route linking Elton and Frodsham to the east and connecting with NCN Route 70 approximately 3.5km to the west near M53 Junction 10, providing access to Ellesmere Port and Chester.

Public Transport

- 17.6.24 The nearest bus stops to the Site are located on Pool Lane and Link Road, approximately 250m from the Pool Lane Site entrance. These stops are served by Bus Service 2, which operates between Chester and Runcorn via Ellesmere Port, Helsby (including the railway station), and Frodsham. Services generally operate hourly during weekdays and Saturdays between approximately 06:00 and 17:00 for the Chester–Runcorn route, with additional hourly services between Chester and Ellesmere Port operating from approximately 06:00 to 23:00. No services operate on Sundays.
- 17.6.25 Pedestrian routes are available between the main SMC entrance on Pool Lane and the nearby bus stops. Public pedestrian access within the SMC itself is restricted, and access to the Site is limited to authorised personnel only. A summary of bus service provision is presented in **Table 17.4**.

Table 17.4 Bus Timetable Information

Stop Location	Service No.	Operator	Route	Frequency (Mon–Fri)	Frequency (Saturday)	Frequency (Sunday)
Pool Lane (Thornton Research Centre located off-side (o/s))	2	Stagecoach	Runcorn – Chester City Centre	1 per hour	1 per hour	No Service
			Chester City Centre – Runcorn	1 per hour	1 per hour	No Service
	2A	Stagecoach	Runcorn – Chester Bus Interchange	1 per day	No Service	No Service
			Chester Bus Interchange – Runcorn	1 per day	No Service	No Service
Link Road (Thornton Research)	2	Stagecoach	Runcorn – Chester City Centre	1 per hour	1 per hour	No Service

Stop Location	Service No.	Operator	Route	Frequency (Mon–Fri)	Frequency (Saturday)	Frequency (Sunday)
Centre located opposite (opp))			Chester City Centre – Runcorn	1 per hour	1 per hour	No Service
	2A	Stagecoach	Runcorn – Chester Bus Interchange	1 per day	No Service	No Service
			Chester Bus Interchange – Runcorn	1 per day	No Service	No Service

17.6.26 The nearest active railway station to Stanlow Refinery is Ince & Elton, which is sited on the branch line from Helsby to Ellesmere Port. Ince & Elton station is located 2km northeast of the Site, to the north of the village of Elton. The station is currently served by four trains per day.

Future Baseline

- 17.6.27 It is anticipated that construction would commence in quarter 4 2028 and would last for approximately 16 months to quarter 1 of 2030. The future baseline scenario of 2029 will be taken into consideration when assessing the Proposed Development (as this serves as the year during which peak construction traffic movement will occur) and appropriate growth factors will be scoped with CWCC and National Highways.
- 17.6.28 The trip generation forecast will include the construction and operational phases of the Proposed Development. Anticipated HGV vehicle numbers will be provided by the Applicant, based on experience of similar sites, as well as staffing numbers. This detail will be contained within the TA.
- 17.6.29 The influence of climate change on the future baseline for the traffic environment experienced at sensitive receptors is difficult to predict with certainty. However, the assessment will consider relevant national and regional policy trajectories aimed at reducing transport-related emissions, including potential shifts in fleet composition (such as increased uptake of electric and low-emission vehicles), changes in travel behaviour, and any associated implications for traffic. Where appropriate, these factors will be qualitatively reflected in the future baseline to ensure that climate-related trends are proportionately accounted for.

Committed Development

- 17.6.30 The future baseline will take account of relevant committed developments that are expected to affect the Study Area during the construction period. Consideration

has been given to the potential for additional developments to come forward between the baseline year and the peak construction year.

- 17.6.31 Following discussions pertaining to CHP Phase 1, a number of committed developments were identified with construction/operational activities overlapping that of both CHP Phase 1 and the Proposed Development. These developments are therefore expected to be reflected within existing traffic conditions for the cumulative construction scenario and are listed in **Table 17.5**.

Table 17.5 Identified Committed Developments - Scoped in/out of Assessment

Development	Application / PINS Reference	Status	Scoping Outcome	Reason
Stanlow CHP Phase 1	25/03828/FUL	TCPA Application being considered by CWCC	Scoped in	Peak construction activity not likely to overlap with the Proposed Development- some activity is likely to overlap so programmes will be compared.
Frodsham Solar Farm	EN010153	Accepted for examination (27 June 2025)	Scoped in	Registered on PINS website May 2025 and accepted 27 June 2025. Reasonable assumption that construction may overlap in 2027 with the construction of the Proposed Development.
Protos Resource Recovery Park	10/01488/FUL (incl. 14/02277/S73)	Under construction	Scoped in	Construction of the development commenced in 2016 with the build-out of Plot 3, Plot 9 and the associated substation, with activity continuing through to 2025, during which Plot 8 is currently under construction. For the purposes of the assessment, it is assumed that Plots 1, 2, 4, 5, 6, 7, 9b, 9c, 9e,

Development	Application / PINS Reference	Status	Scoping Outcome	Reason
				9f, 10a, 10b, 11, 12, 13, 14 and 15, together with the associated full rail link, are also likely to be under construction in some form during the forecast construction period of the CHP.
Energy from Waste Facility (Protos Plot 8)	16/03074/FUL	Under construction	Scoped in	Currently under construction (Plot 8 of application 10/01488/FUL) – assumed to be operational in 2027.
Resource Recovery Facility	20/04396/FUL	Under construction	Scoped in	Currently under construction assumed to be operational in 2027.
HyNet Runcorn CO ₂ Spur Pipeline	25/00293/FULEIA	EIA validated (8 July 2025)	Scoped in	Development construction starts January 2027 - Forecasted overlap of construction peaks between July - October 2027.
CO ₂ Capture Facility (Protos Plot)	24/00261/FUL	Approved	Scoped out	Same development as 25/00293/FUL EIA but submitted to another authority – excluded to avoid duplication.
HyNet Carbon Dioxide Pipeline (DCO)	EN070007	Approved (20 March 2024)	Scoped in	The submitted TA provided a construction timeline of April 2024 to July 2025 with the peak month of construction anticipated August 2024, which does not overlap with the peak of construction for CHP in 2027, however, due to the delay in receiving planning

Development	Application / PINS Reference	Status	Scoping Outcome	Reason
				permission, construction programmes may overlap.
Area 10B Ince Resource Recovery Park (Hydrogen & Power)	19/03489/FUL	Approved (March 2020)	Scoped out	Planning Statement identifies that construction would take nine months from the point of planning approval. Approval was granted in March 2020. Protos website shows the plot as under construction so likely captured in the traffic survey flows and forms part of the baseline.
HyNet Protos CO ₂ Spur Pipeline	25/00952/FUL	Approved (14 August 2025)	Scoped in	The Planning Application materials indicate that construction of the scheme is scheduled for completion by March 2027, ahead of the forecast peak construction period for the CHP but with some overlap with the full construction period.
Protos Plots 9b, 10a, 11 & 12 (Recycling & Hydrogen Refuelling)	21/04076/FUL	Approved (September 2022)	Scoped out	Approval was granted in September 2022. Longest construction identified as 24 months within its ES Volume 1 Construction Methods. Expected to be finished construction in 2024. Protos website shows the plots as either occupied or available and therefore constructed.

Development	Application / PINS Reference	Status	Scoping Outcome	Reason
Encirc Glass, Ash Road, Elton	22/03693/FUL / 25/02108/FUL	Awaiting decision	Scoped out	The development remains extant but is yet to be implemented. The planning portal contains a signed S106 Agreement (uploaded 21 August 2024); however, no formal decision notice issued.
Removal of Condition 17 (Protos Rail Infrastructure)	24/01322/S73	Awaiting decision	Scoped out	This is a plot within 10/01488/FUL (with Variation of Conditions 14/02277/S73) Construction traffic captured associated with Plot 8 is to be used as proxy for construction activity.
Installation of a new underground natural gas pipeline located on land south-east of SMC	23/03369/FUL	Awaiting decision	Scoped out	No traffic impact
Peak Cluster CCS Pipeline	EN0710001	Pre-application	Scoped out	The submitted TA states that peak of construction is expected to occur over a 12-month period (Summer 2025 – Summer 2026) with peak of construction is anticipated Q2 2026. Project is also in the pre-application stage and therefore compounds justification for this proposal to not be considered within this assessment.
HyNet North West Hydrogen Pipeline	EN060006	Pre-application	Scoped out	The proposal is currently at preapplication stage, therefore, is not to be

Development	Application / PINS Reference	Status	Scoping Outcome	Reason
				considered within this assessment.
HyNet Hydrogen Production Plant Phase 1 & Phase 2	21/04091/FUL	Approved (July 2024)	Scoped in	The submitted ES documentation proposes a 40-month construction programme, which would result in overlap with the Proposed Development's construction programme.

Sensitive Receptors

17.6.32 The EATM guidelines recognise that it is useful to identify groups of people or locations that may be sensitive to changes in traffic conditions, and details which groups or locations are considered sensitive, defined by the presence of sensitive receptors. This includes:

- people at home;
- people at work;
- sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors);
- locations with concentrations of vulnerable users (e.g., hospitals, places of worship, schools);
- retail areas;
- recreational areas;
- tourist attractions;
- collision clusters, and routes with road safety concerns; and
- junctions and highway links at (or over) capacity.

17.6.33 The following sensitive receptors have been identified within the Study Area for the Proposed Development:

- Motorised Users: Motorised users of the surrounding highway network, including vehicle drivers and public transport users; and

- Non-Motorised Users: Non-motorised users of the surrounding highway network, PRow and non-designated public routes, including pedestrians, cyclists, equestrians (and vulnerable groups).

17.7 Description of Likely Significant Effects

Construction Phase

- 17.7.1 The Proposed Development may affect receptors following the consideration of embedded mitigation measures within the assessment. It is anticipated that the construction phase of the Proposed Development will be when volumes of traffic are at their greatest and will result in temporary increases in traffic flows on the highway network, as well as temporarily disrupt pedestrians, cyclists and road users.
- 17.7.2 The potential for likely significant effects, associated with the construction phase on the routes which connect to the Site within the Study Area, include:
- severance and pedestrian delay (incorporating all non-motorised users);
 - non-motorised user amenity;
 - fear and intimidation;
 - driver delay;
 - road safety; and
 - hazardous loads / large loads.
- 17.7.3 It is not considered that there will be significant effects within the Site. However, further consideration will be given to these potential effects within the ES and TA:

Scope of Assessment

- 17.7.4 A summary of the proposed scope for the transport and movement construction and operational phase assessments is presented in **Table 17.6**.

Table 17.6 Elements scoped in or out of further assessment

Element	Phase	Scoped In	Scoped Out	Justification
Construction Traffic (Severance and Pedestrian Delay, Non-motorised User Amenity, Fear and	Construction	Yes		Preliminary information indicates that there will be between 50 to 150 people on-site during the construction

Element	Phase	Scoped In	Scoped Out	Justification
Intimidation, Driver Delay, Road Safety, Hazardous Loads / Large Loads)				phase, increasing to 300 people at the peak of activity. In addition, during the construction phase, materials will be delivered by road as set out in Chapter 2: The Proposed Development. The number of HGV movements is currently unknown. It is anticipated that AILs, such as cranes, will be transported to Site by road with between two to four AILs expected between months 7 and 11 of the build. Further detail will be set out in the TA. Based on the current available construction traffic impacts are scoped in.
Operation Traffic (Severance and Pedestrian Delay, Non-motorised User Amenity, Fear and Intimidation, Driver Delay, Road Safety, Hazardous Loads / Large Loads)	Operational		Yes	It is considered that the operational phase is unlikely to give rise to any significant environmental traffic and movement effects due to the very low traffic movements anticipated during the operation of the Proposed Development. The existing CHP facility will be retired in stages as Phase 1 and subsequently the Proposed Development become operational. Personnel from the existing CHP facility will transfer over as the operation of the Proposed Development increases. Staffing numbers will remain as per the existing arrangement with 24-hour security already in operation at the Site. The Proposed Development will not be in receipt of fuel deliveries to Site as the Proposed Development will run off refinery off-gas until hydrogen production is available.

Element	Phase	Scoped In	Scoped Out	Justification
				As such, the operational traffic impacts of the Site are not expected to change the baseline traffic flows within the Study Area by more than 10%, therefore in line with EATM Guidelines ¹ can be scoped out. This will be evidenced in the TA.

17.8 Mitigation Measures

Construction Phase

- 17.8.1 A number of embedded mitigation measures are proposed to facilitate the development or be required as a consequence during the construction phase. This will include measures necessary as part of the design of the development or measures that have been identified through the assessment process, including through the production of the TA.
- 17.8.2 It is not anticipated that the development will result in a significant increase in traffic on the local highway network. However, embedded mitigation measures will, as a foundation, include the production of a Construction Traffic Management Plan (CTMP), as part of an Outline Code of Construction Practice (CoCP) (construction phase), and a TP (operational phase). It is not anticipated that any additional mitigation measures will be required.
- 17.8.3 The CTMP will be bespoke to the Proposed Development and will include information on principal points such as, but not limited to, the following:
- times and days of construction vehicle movements to and from the Proposed Development;
 - routing for construction vehicles;
 - access arrangements and times of movement to minimise impacts on the surrounding highway network; and
 - suitable off-highway parking for all construction related vehicles, considerate of the potential for the implementation of overflow parking as seen in CHP Phase 1.
- 17.8.4 The TP will also be bespoke to the Proposed Development and will include information on principal points such as, but not limited to, the following:

- summary of existing active travel and sustainable travel modes closest to the Proposed Development; identification of a TP coordinator to oversee the implementation, monitoring and review of the TP;
- travel initiatives for staff; and
- parking provision for staff.

17.8.5 The CTMP and TP will form part of the DCO application. It is not anticipated that any additional mitigation measures will be required.

Operational Phase

17.8.6 It is anticipated that limited design, embedded mitigation or enhancement measures will be required as the operational phase is unlikely to give rise to any significant environmental traffic and movement effects. This will be determined through the production of the TA.

17.9 Assessment Methodology

17.9.1 The proposed assessment methodology will be used to evaluate the traffic and transport environmental effects associated with the Proposed Development during the construction phase only. It is proposed that operational phase effects will be scoped out of the ES and therefore are not discussed further in this chapter.

17.9.2 The assessment methodology and the assumptions underpinning the assessment (within the TA) will be agreed with CWCC and National Highways to ensure that it meets the necessary standards and guidelines.

17.9.3 The proposed assessment methodology draws upon the policy, legislation and guidance contained within **Section 17.4**, along with the key traffic and transport details outlined in the following subsections.

17.9.4 The Study Area is set out in **Section 17.5** and will be refined based upon 'Rule 1' and 'Rule 2' of the EATM Guidelines (IEMA, 2023).

Construction Phase

17.9.5 The construction phase assessment will be undertaken in line the EATM Guidelines (IEMA, 2023). The assessment will evaluate the traffic and movement conditions during the 'peak construction' year.

17.9.6 The construction phase assessment will include:

- **Severance and pedestrian delay** (incorporating all non-motorised users):
 - the separation of people from places and other people and places or to impede access to essential facilities;

- the ability of people to cross roads as a result of changes in traffic volume, composition and speed, the level of pedestrian activity, visibility and general physical conditions of the Proposed Development.
- **Non-motorised user amenity:** the relative pleasantness of a journey resulting from changes in traffic flow, traffic composition, and pavement width/separation from traffic;
- **Fear and intimidation:** the fear and intimidation levels experienced by people as a result of an increase in traffic volume and the proximity of traffic to people proximity;
- **Driver delay:** traffic delays to general traffic; and
- **Road safety:** the risk of accidents occurring and the severity of injury that occurs, where intensification of use or changes in the composition of traffic has the potential to effect collision rates:
 - Large Loads: the transportation of abnormal loads by road; and
 - Hazardous Loads: the transportation of dangerous or hazardous loads.

17.9.7 Junction capacity assessments will be undertaken at the junctions for the 'peak construction' year aligning with peak construction activities. The following assessment scenarios are proposed for the construction phase and will be discussed further with CWCC and National Highways through additional Scoping discussions:

- 'Baseline' Scenario: this is the surveyed traffic flows;
- 'Do Minimum' Scenario: this is the Baseline Scenario plus traffic growth using TEMPro and committed development; and
- 'Do Something' Scenario: this is the Do Minimum plus construction traffic associated with the Proposed Development.

Operational Phase

17.9.8 As set out in the EIA Scoping Opinion for CHP Phase 1, CWCC agrees that the following effects would not be likely to be significant and, do not need to be considered further and are therefore scoped out:

- **Operational Phase:**
 - Severance and Pedestrian Delay;
 - Non-motorised User Amenity;
 - Fear and Intimidation;

- Driver Delay;
- Road Safety;
- Large Loads; and
- Hazardous Loads.

Significance Criteria

- 17.9.9 As described at **Chapter 3: Approach to EIA**, the methodology for assessing the significance of an effect will be based on the environmental sensitivity (or value/importance) of a receptor and the magnitude of change from baseline conditions.
- 17.9.10 The approach to determining the sensitivity of receptors, magnitude of impacts and the significance of effects considered for the impacts identified below and is required by the EATM Guidelines (IEMA, 2023).

Sensitivity of Receptor

- 17.9.11 A desk-study exercise has been undertaken to classify the sensitivity of the links within the Study Area based on the guidance in LA 104 (National Highways, 2020b). The classification of the link sensitivity is based on professional judgement and the methodology for classifying the sensitivity is shown in **Table 17.7**.
- 17.9.12 For example, if the link passes a school, care home or similar it would have a higher sensitivity due to the presence of vulnerable users. Similarly, if the link runs through the middle of a town or village, it will have a higher sensitivity than if there was limited direct access to frontage development.
- 17.9.13 In accordance with Table 3.2 of LA 104 (National Highways, 2020b), the sensitivity of the affected receptors will be assessed on a scale of very high, high, medium, low and negligible in the context of the sensitivity of the road links within the Study Area, as follows:

Table 17.7 Environmental Value (Sensitivity)

Value (Sensitivity) of receptor/resource	Typical Description
Very High	Very high concentration of people at home, people at work, sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors), locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools), retail areas, recreational areas, tourist attractions.

Value (Sensitivity) of receptor/resource	Typical Description
	Limited separation of footway/cycleways from traffic. Significant level of pedestrian/cycle desire lines. A volume/highway capacity (i.e. V/C ratio) greater than 100%. A link with three or more fatal collisions happening either within a junction or within a 100m stretch.
High	High concentration of people at home, people at work, sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors), locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools), retail areas, recreational areas, tourist attractions. Some separation of footway/cycleways from traffic. Increased level of pedestrian/cycle desire lines present. A volume/highway capacity (i.e. V/C ratio) greater than 95%. A link with three or more serious collisions happening either within a junction or within a 100m stretch.
Medium	Medium concentration of people at home, people at work, sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors), locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools), retail areas, recreational areas, tourist attractions. Reduced separation of footway/cycleways from traffic. Some level of pedestrian/cycle desire lines. A volume/highway capacity (i.e. V/C ratio) greater than 90%. A link with six or more slight collisions happening either within a junction or within a 100m stretch.
Low	Low concentration of people at home, people at work, sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors), locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools), retail areas, recreational areas, tourist attractions. High standard of highway with separation of vulnerable users and can accommodate changes in traffic volume. A volume/highway capacity (i.e. V/C ratio) greater than 85%. A link or junction where no clusters have been identified but there are isolated incidents.
Negligible	Very low concentration of people at home, people at work, sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors), locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools), retail areas, recreational areas, tourist attractions. High standard of highway

Value (Sensitivity) of receptor/resource	Typical Description
	with large separation of vulnerable users and can accommodate changes in traffic volume. A volume/highway capacity (i.e. V/C ratio) less than 85%. A link or junction where there have no recorded personal injury collisions.

Table 17.8 Sensitivity of Receptors for NMUs and Motorised Users

Link Description	Non-motorised Users Sensitivity	Motorised Users Sensitivity	Rationale
Site Access Road (Gate 6)	Low	Low	Four-lane single carriageway access road providing access into the SMC only and not open to public traffic.
Pool Lane (Site Access Road to A5117)	Low	Low	Four-lane single carriageway with no central reservation. Footway along the eastern side; western side bounded by the SMC.
Pool Lane (Oil Sites Road to Site Access Road)	Low	Low	Single carriageway subject to a 50-miles-per-hour (mph) speed limit. Narrow path present; no frontage access.
Oil Sites Road	Low	Low	Single carriageway private road available to authorised vehicles only. Footway present; provides access to industrial estates flanking the road.
Pool Lane (North of Oil Sites Road)	Low	Low	Single carriageway subject to a 40-mph speed limit. Short length of footway; no frontage access.
Protos Access Road (Oil Sites Road to Ash Road)	Low	Low	Access road to Protos Land with a narrow footway along the northern side and no frontage access.
A5117 eastbound (Pool Lane to Ince Lane)	Medium	Medium	Dual carriageway with limited frontage access near Pool Lane and a foot/cycle path along the northern side.
A5117 westbound (Pool Lane to Ince Lane)	Medium	Medium	Dual carriageway with limited frontage access near Pool Lane and a foot/cycle path along the northern side.
Ince Lane	Very High	Very High	Single carriageway providing access to Elton Village with

Link Description	Non-motorised Users Sensitivity	Motorised Users Sensitivity	Rationale
			frontage development along the road.
M56 Junction 14 (East Side) – Mainline eastbound	Negligible	Negligible	Motorway with derestricted speed limit, subject to motorway regulations.
M56 Junction 14 (East Side) – Mainline westbound	Negligible	Negligible	Motorway with derestricted speed limit, subject to motorway regulations.
M56 Junction 14 (East Side) – Diverge	Negligible	Negligible	Motorway slip road subject to motorway regulations.
A5117 (South of M56 J14) southbound	Negligible	Negligible	Single carriageway A-road subject to a 60-mph speed limit; no frontage development.
A5117 (South of M56 J14) northbound	Negligible	Negligible	Single carriageway A-road subject to a 60-mph speed limit; no frontage development.
M56 Junction 14 (West Side) – Diverge	Negligible	Negligible	Motorway diverge subject to motorway regulations with derestricted speed limit.
A5117 (Pool Lane to Thornton Green Lane)	Low	Low	Dual carriageway with limited frontage access and shared footway/cycleway along the northern side.
A5117 (Thornton Green Lane to M53 Junction 10)	Low	Low	Dual carriageway with limited frontage access and shared footway/cycleway along the northern side.
M53 Mainline (north of junction)	Negligible	Negligible	Motorway with derestricted speed limit subject to motorway regulations.
M53 Mainline (south of junction)	Negligible	Negligible	Motorway with derestricted speed limit subject to motorway regulations.
M53 Junction 10 (south side) – Diverge	Negligible	Negligible	Motorway slip road subject to motorway regulations.
A5117 (west of M53 Junction 10)	Medium	Medium	Dual carriageway with limited frontage access, foot/cycle path on northern side and access to a retail park.
M53 Junction 10 (north side) – Diverge	Negligible	Negligible	Motorway slip road subject to motorway regulations.

Magnitude of Impact

- 17.9.14 The traffic generated by the Proposed Development will be used to assess the impacts on the key links and junctions on the surrounding network. The likely effects of the Proposed Development in environmental terms will be evaluated in accordance with the EATM Guidelines (IEMA, 2023).
- 17.9.15 The guidelines acknowledge that for many effects, there are no simple rules or formulae that define thresholds of significance. There is, therefore, a need for interpretation and the application of professional judgement on the part of the assessor, backed up by data or quantified information wherever practicable.

Severance and Pedestrian Delay

- 17.9.16 Severance occurs in a community when a major artery separates people from places and other people. Severance occurs from difficulty of crossing a road or where the road itself creates a physical barrier. Severance can be caused to pedestrians or motorists. EATM (IEMA, 2023) states that historical guidance published by the Department for Transport suggested changes in total traffic flow of 30%, 60% and 90% result in slight, moderate, and substantial changes in severance respectively. EATM (IEMA, 2023) notes that this guidance no longer appears in Department for Transport guidance but has not been superseded by subsequent changes. On this basis, it is considered appropriate to continue using these indicators to assess severance.
- 17.9.17 **Table 17.9** contains how the magnitude of impacts on receptors shall be reported with respect to severance.

Table 17.9 Magnitude of impact (severance)

	Magnitude of Impact (degree of change)				
	No Change	Negligible	Minor	Moderate	Major
Severance and Pedestrian Delay	No change in traffic flow	Change in total traffic flow of <30%	Change in total traffic flow of 30% to 60%	Change in total traffic flow of 61% to 90%	Change in total traffic flow of >90%

Non-Motorised User Amenity

- 17.9.18 Non-motorised user amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition, pavement width and separation between vehicles and pedestrians. The impact manifests itself in fear and intimidation, exposure to noise and vehicle emissions. EATM (IEMA, 2023) states that historical guidance published by the Department

for Transport suggested that a doubling or halving of total traffic flow or the HGV composition could lead to perceptible adverse or beneficial impacts upon non-motorised user amenity. As noted above in relation to Severance and Pedestrian Delay, EATM (IEMA, 2023) notes that this guidance no longer appears in Department for Transport guidance, however, it has not been superseded by subsequent changes and is established through planning case law.

- 17.9.19 On this basis, it is considered appropriate to continue using these indicators to assess non-motorised user amenity. **Table 17.10** contains how the magnitude of impacts on receptors shall be reported within this preliminary assessment with respect to non-motorised user amenity.

Table 17.10 Magnitude of impact (non-motorised user amenity)

	Magnitude of Impact				
	No Change	Negligible	Minor	Moderate	Major
Non-Motorised User Amenity	No change in traffic flow	Changes in traffic flow (or HGV component) <30%	Changes in traffic flow (or HGV component) >30 and <50%	Changes in traffic flow (or HGV component) of 50% to 100%	Changes in traffic flow (or HGV component) of >100%

Fear and Intimidation

- 17.9.20 EATM (IEMA, 2023) states that the extent of fear and intimidation is dependent on the total volume of traffic, the heavy vehicle composition, the speed that these vehicles are passing and the proximity of traffic to people. EATM (IEMA, 2023) provides a weighted system to provide an approximation of the likelihood of pedestrian fear and intimidation. The degree of hazard is assessed with reference to the established thresholds (a, b and c) (see **Table 17.11**) and a score is provided for each combination on a highway link under consideration (see **Table 17.12**). The magnitude of impact is approximated with reference to changes in the level of fear and intimidation from baseline conditions with reference to annual average daily traffic movements (AADT) (see **Table 17.13**).

Table 17.11 Fear and intimidation degree of hazard

Average Traffic Flow Over 18-hour Day – All Vehicles /Hour 2-Way (a)	Total 18-hour Heavy Vehicle Flow (b)	Average Vehicle Speeds (c)	Degree of Hazard Score
+1,800	+3,000	-> 40	30
1,200 – 1,800	2,000 – 3,000	30 – 40	20
600 – 1,200	1,000 – 2,000	20 – 30	10
<600	<1,000	<20	0

Table 17.12 Levels of fear and intimidation

Level of Fear and Intimidation	Total Hazard Score (a) + (b) + (c)
Extreme	71+
Great	41 – 70
Moderate	21 – 40
Small	0 – 20

Table 17.13 Magnitude of impact (fear and intimidation)

Magnitude of Impact	Change in Step /Traffic Flows (AADT) from Baseline Conditions
High	Two step changes in level.
Medium	One step change in level, but with: ▪ >400 Vectored Exception Handling (VEH) increase in average 18-hr All Vehicle (AV) two-way all vehicles flow; and /or ▪ >500 Heavy Vehicle (HV) increase in total 18hr HV flow.
Low	One step change in level, but with: ▪ <400veh increase in average 18-hr All AV two-way all vehicles flow; and /or ▪ <500HV increase in total 18hr HV flow.
Negligible	No change in step changes.
No Change	No change in traffic flows.

Driver Delay

- 17.9.21 Driver delay is only likely to be significant where the existing Study Area highway network is at or close to capacity. In accordance with EATM (IEMA, 2023) this approach is considered to be appropriate to assess driver delay.
- 17.9.22 The magnitude of impact will be derived using professional judgment, informed by the increase in vehicle delay and whether a junction is at, or close to capacity. At this stage, the impact on driver delay has not been assessed. Impacts to local network performance will be assessed in the TA and impacts to driver delay presented in the ES.

Road Safety

- 17.9.23 Road safety is assessed by the frequency and severity of injury accidents that are attended by the police and recorded in official accident statistics. Intensification of use or changes in the composition of traffic has the potential to have an effect on collision rates. The examination of recent collision statistics on routes within the Study Area will highlight any hotspots that need further examination.
- 17.9.24 PIC records for the local highway network will be examined for the latest five-year period, or as agreed with CWCC and National Highways, to allow for a full highway safety analysis to be undertaken which is unaffected by the Covid-19 pandemic, along with obtaining all PIC records since then to ensure a comprehensive analysis has been undertaken. In accordance with EATM (IEMA, 2023), this approach is considered to be appropriate to assess road safety.
- 17.9.25 The magnitude of impact will be derived using professional judgment, informed by the frequency and severity of recorded collisions within the Study Area and the forecast increase in traffic.

Road Safety Audits

- 17.9.26 Though not currently proposed, if any engineering changes are required within the adopted highway network, the road safety attributes would be reviewed in accordance with the standard and prescribed Road Safety Audits (GG 119 – Road Safety Audit DMRB).

Hazardous Loads/Large Loads

- 17.9.27 The assessment of dangerous or hazardous loads will be based upon the nature of dangerous or hazardous loads being transported and the number of movements anticipated to illustrate the potential and likely effect of a catastrophic event. Depending on the nature and number of movements this assessment could be

included within the assessment of 'Fear and Intimidation' or a separate assessment.

Significance of Effect

- 17.9.28 The traffic generated by the Proposed Development will be used to assess the likely impacts on the key links and junctions on the surrounding network. The significance of the traffic and transport related environmental effects is a function of the magnitude of change associated with the Proposed Development and the sensitivity of the affected receptor. The significance of effect will be reported using the classifications and matrix for significance basis set out in **Table 17.14**.
- 17.9.29 **Table 17.14** combines sensitivity with the magnitude of impact (degree of change), classifying the effects as negligible, minor, moderate or major (adverse or beneficial) which is based on Table 3.8.1 from LA 104 (National Highways, 2020b).

Table 17.14 Significance of effect criteria (severance and pedestrian delay, non-motorised user amenity, driver delay)

		Magnitude of Impact (degree of change)				
		No Change	Negligible	Minor	Moderate	Major
Environmental Value (Sensitivity)	Very High	Neutral	Slight	Moderate	Large	Very Large
	High	Neutral	Slight	Moderate	Moderate	Large
	Medium	Neutral	Neutral	Slight	Moderate	Moderate
	Low	Neutral	Neutral	Slight	Slight	Moderate
	Negligible	Neutral	Neutral	Neutral	Neutral	Slight

- 17.9.30 The assessment of the significance of environmental effects shall also cover the following factors:
- the receptors/resources (natural and human) that would be affected and the pathways for such effects;
 - the geographic importance, sensitivity or value of receptors/resources;
 - the duration (long or short term); permanence (permanent or temporary) and changes in significance (increase or decrease);
 - reversibility - e.g. is the change reversible or irreversible, permanent or temporary;

- environmental and health standards (e.g. local air quality standards) being threatened; and
- feasibility and mechanisms for delivering mitigating measures, e.g. Is there evidence of the ability to legally deliver the environmental assumptions which are the basis for the assessment?

17.9.31 'Significant effects' comprise residual effects that are within the moderate, large or very large categories for the purposes of this EIA; neutral or slight effects are 'not significant'.

17.10 Traffic Impact

Vision

- 17.10.1 In Circular 01/2022, National Highways recommends that developments include a transport vision and supporting strategies, underpinned by a residual traffic impact assessment.
- 17.10.2 It is proposed that the operational phase of the Proposed Development is to be scoped out of the EIA and consequently, a formal transport vision will not be considered appropriate. Nevertheless, the principles of Circular 01/2022 will be considered.
- 17.10.3 An Outline CTMP and an Outline Construction Worker Travel Plan (CWTP) will be submitted with the DCO Application. The Outline CWTP will outline measures to promote sustainable travel among staff and will include target mode shares, and how to manage the construction traffic impacts.
- 17.10.4 Circular 01/2022 addresses a wide range of development scenarios. In this instance, the Proposed Development is expected to generate only temporary impacts during construction and negligible operational traffic. Although a formal transport vision will not be provided, the Applicant remains committed to implementing strategies that reduce reliance on private vehicles and support the sustainable transport objectives set out in Circular 01/2022.

17.11 Traffic Forecast Assumptions

- 17.11.1 The following parameters have been identified based on information provided by the Applicant:

Construction traffic routing

- HGV deliveries assumed to originate broadly as follows:
 - 50% from North Wales;

- 25% from the Port of Dover; and
- 25% from the Port of Hull.
- All construction HGV traffic is assumed to access the Site via M56 Junction 14 (100%), with onward distribution split approximately 50% east and 50% west.

Construction working hours and delivery profile

- Construction activities:
 - Monday–Friday: 08:00–18:00;
 - Saturday: 08:00–13:00;
 - No Sundays or Bank Holidays; and
 - Start-up and shutdown activities may occur within 1 hour of standard hours.
- HGV deliveries are anticipated to be distributed across the working day, rather than concentrated in peak hours.

Assessment year

- The traffic assessment is assumed to be undertaken for the peak construction year (2029), reflecting the period of highest workforce and delivery activity.

Construction workforce assumptions

- It is assumed that:
 - 80% of the workforce will commute from home within a 60-minute travel time; and
 - 20% of the workforce will stay in local hotel accommodation.
- These assumptions are consistent with Phase 1 and have been confirmed for Phase 2.

Construction worker travel behaviour

- Car-sharing assumptions are consistent with those applied in Phase 1:
 - For hotel-based workers:
 - Approximately 50% will travel to site as car drivers; and
 - The remaining workers will primarily travel as car or van passengers.
 - For home-based workers:
 - Approximately 75% are assumed to travel as car drivers; and

- Lower car sharing levels are assumed due to wider geographic spread of home locations.

Abnormal Indivisible Loads (AILs)

- AILs are assumed to be transported by road via:
 - M53 Junction 10 and/or; and
 - M56 Junction 14.
- Routing will be subject to agreement with National Highways and CWCC; and
- The Construction Traffic Management Plan (CTMP) will provide the framework for managing AIL movements and ongoing liaison with highway authorities.

Operational staffing and traffic assumptions

- Operational phase will be staffed on a 24/7 basis with 12-hour shifts (07:00 and 19:00 changeovers); and
- Total operational staffing assumed to be 35-40 staff, comprising:
 - 18 shift-based staff; and
 - Remaining staff as weekday day workers (Mon–Fri, 08:00–18:00).
- Operational vehicle movements are assumed to be limited and routine:
 - No planned weekend traffic outside turnaround events;
 - Approximately 1 HGV movement per working day;
 - Approximately 2 LGV movements per day; and
 - Operational traffic patterns are expected to broadly reflect existing baseline conditions.

17.12 Traffic Forecast

- 17.12.1 The construction of the Proposed Development is anticipated to last 16 months. Works are expected to commence in August 2028, subject to the grant of planning permission, and the peak construction operations is scheduled for January – March 2030.

Light Goods Vehicles (LGVs)

- 17.12.2 A large proportion of the construction staff will stay in accommodation local to the Site and travel to the Site together by car, van or minibus.

- 17.12.3 Throughout the construction period the average size of the construction workforce would fluctuate depending on the activities being undertaken. It is anticipated that the workforce would reach approximately 600 at its peak of activity (forecast in January 2029 to March 2029).
- 17.12.4 Reflecting the excellent opportunities for sourcing workforce personnel from local areas, it is assumed that 80% of the workforce will be from within a 60-minute commute. The remaining 20% of the workforce will use local accommodation within the surrounding area, with an approximate 60-minute travel time.
- 17.12.5 To minimise peak traffic volumes and to reduce pressure on the onsite construction welfare facilities, staggered start times for different trades on Site are anticipated during the construction phase, dependent upon the stage of works being undertaken and the type of specialist staff required on Site.
- 17.12.6 It is anticipated that a proportion of construction staff will travel to the Site by car sharing or other forms of shared transport. For hotel-based staff, a car share ratio of 2.00 staff per vehicle is forecast in line with industry standards, while a ratio of 1.25 is anticipated for home-based staff. It is also expected that some visitors to the Site will arrive by car or small van, with on-site parking available for these vehicles. In addition, a small number of LGV deliveries will also be made.
- 17.12.7 Considering the car share ratios and applying the traffic distribution forecasts from CHP Phase 1, **Plate 1**, **Plate 2** and **Plate 3** provide the provisional Proposed Development daily home and hotel-based LGV / car traffic impact forecast based on the current peak construction programme. This temporary impact is anticipated for a period of three months only.

Plate 1 Predicted Construction Worker Flows Home Based Trips

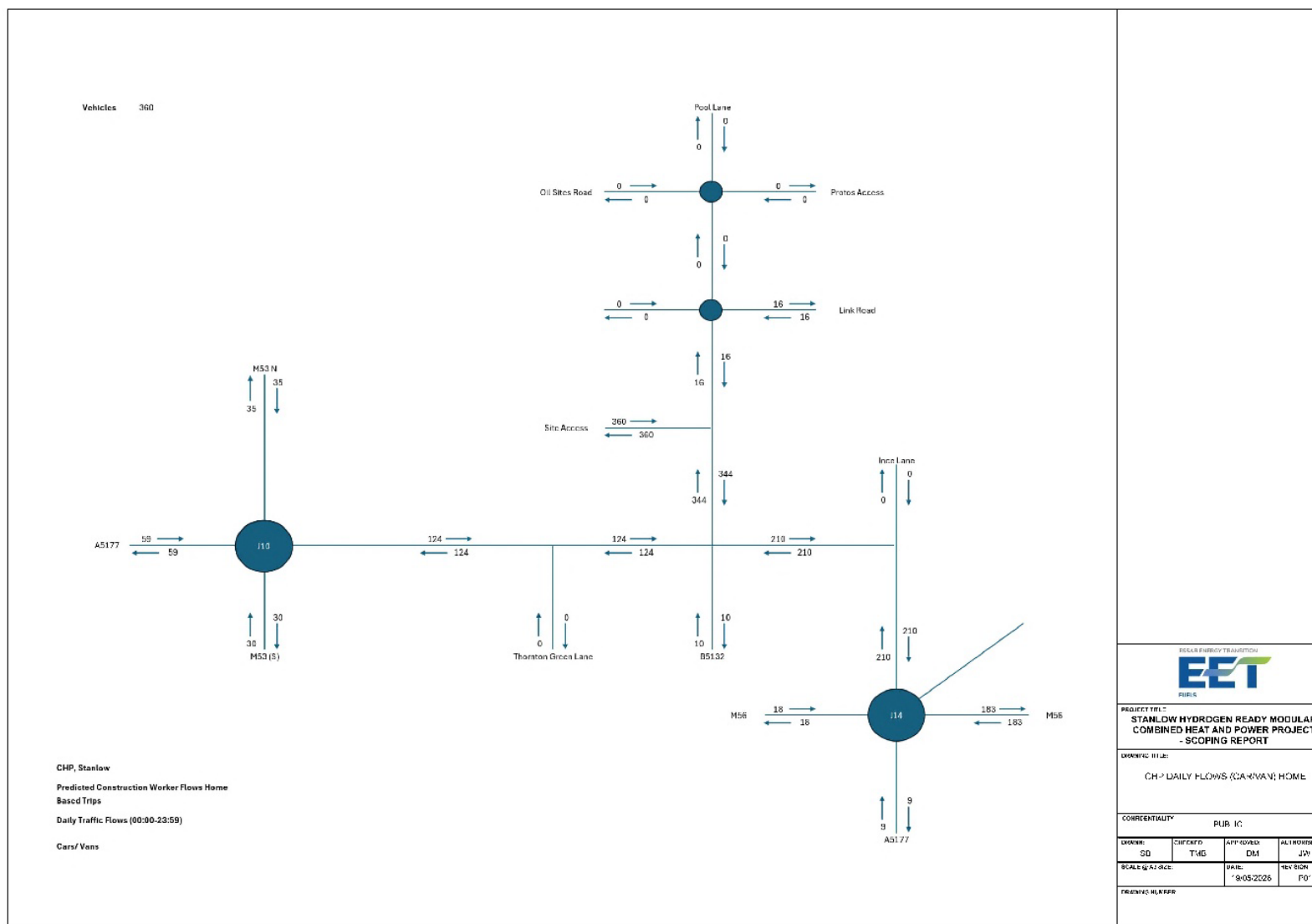


Plate 2 Predicted Construction Worker Flows Hotel Based Trips

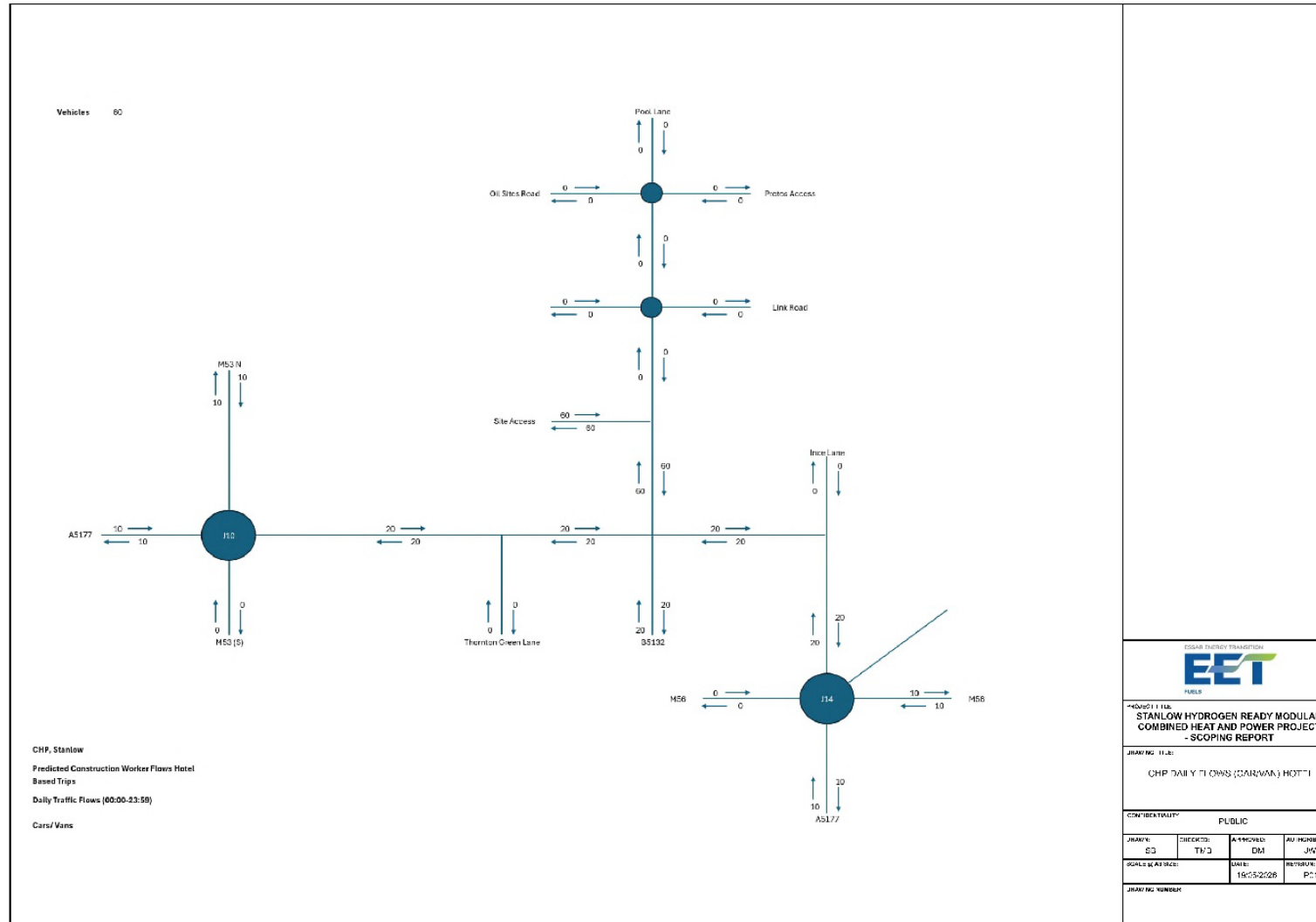
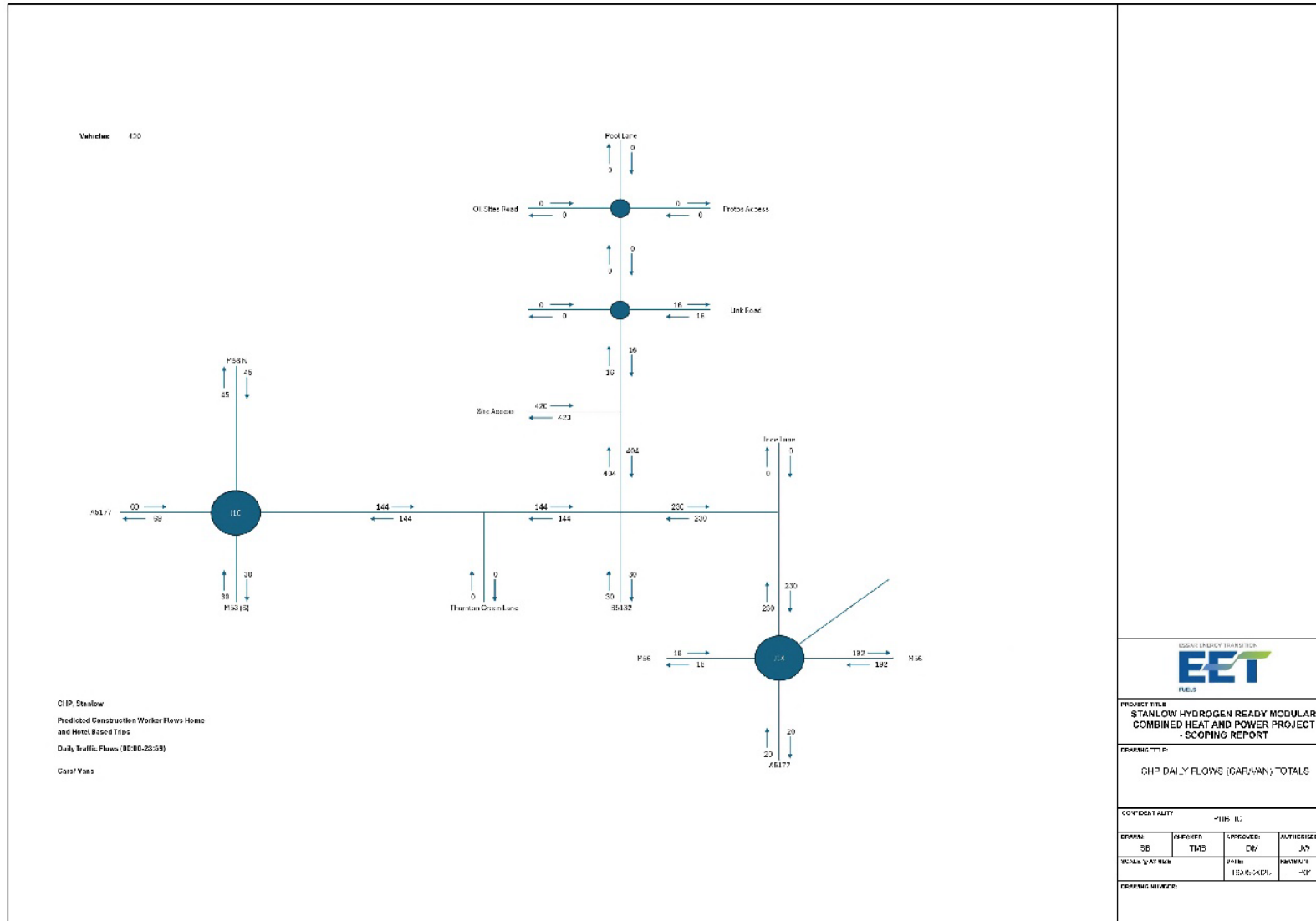


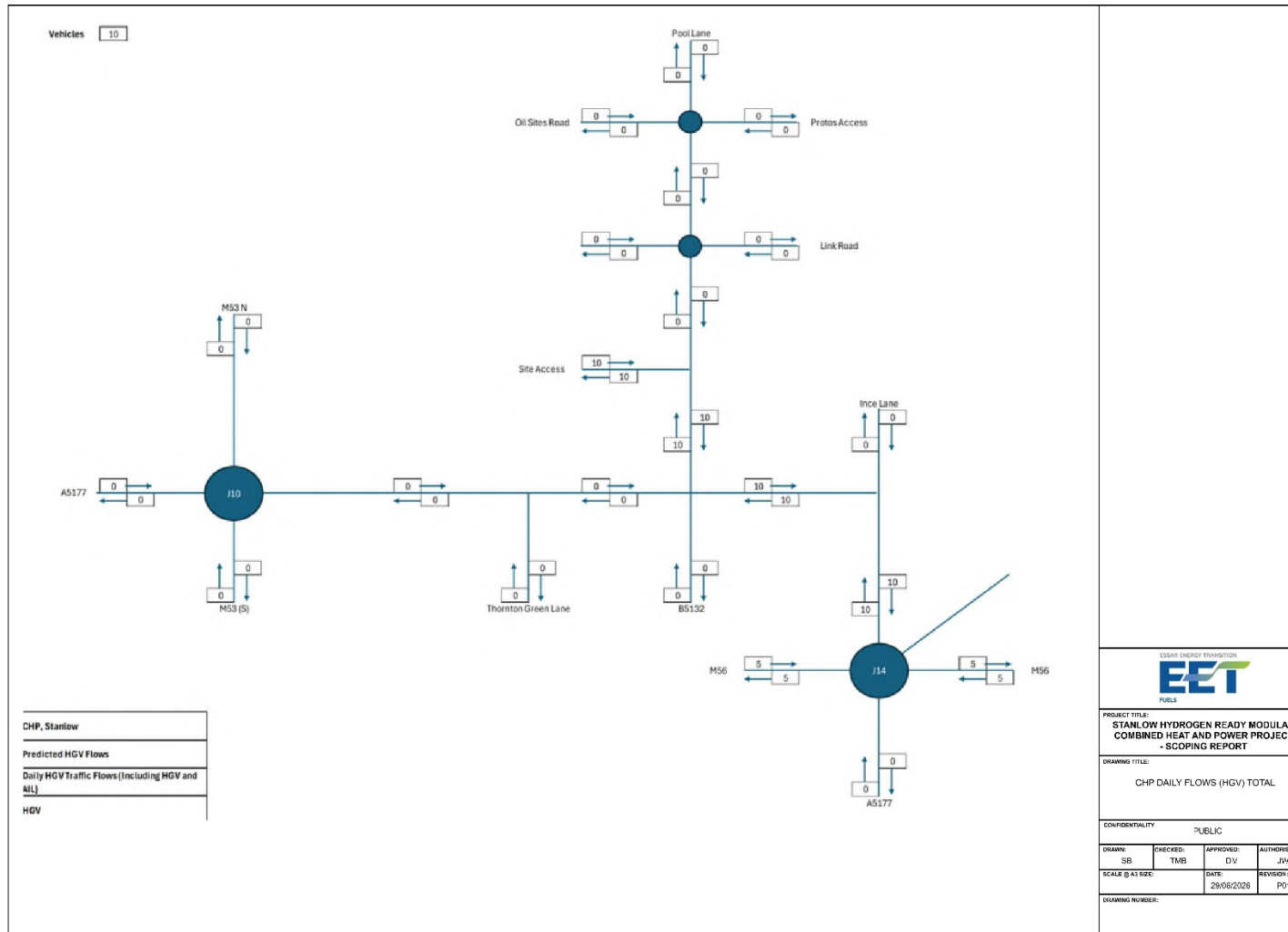
Plate 3 Predicted Construction Worker Flows Home and Hotel Based Trips



Heavy Goods Vehicles (HGVs)

- 17.12.8 The estimated volume and type of vehicles that would be generated throughout the construction phase of development has been informed by the Applicant's anticipated construction programme, which is based on their extensive experience of delivering similar developments throughout the country.
- 17.12.9 The rate of deliveries will fluctuate over this time. It is anticipated that up to 10 two-way HGV movements (20 trips) will be required per day throughout the construction period.
- 17.12.10 **Plate 4** indicates the provisional Proposed Development HGV traffic impact forecast based on the current peak construction programme.

Plate 4 Daily HGV Traffic Flows (Including HGV and AIL)



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PUBLIC

EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Volume 1, Chapter 18: Major Accidents and Disasters**

02-09-2026

Document ref: 2026UK550445-ENV-001



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18. Major Accidents and Disasters

18.1 Introduction

- 18.1.1 This chapter considers the vulnerability of the Proposed Development to major accidents and disasters (MA&D) during the construction and operational phases, caused by natural hazards or manmade hazards (including operational failure), and any potential significant effects. It also considers impacts to receptors arising from MA&D affecting the Proposed Development. It sets out the proposed methodology for the MA&D assessment and identifies those MA&D categories and types which can be scoped out of the Environmental Impact Assessment (EIA).
- 18.1.2 Technical terminology applicable to this chapter is provided in **Volume 3, Appendix 1.1: Glossary and Abbreviations**.
- 18.1.3 Based on professional judgement, MA&D are events or situations that have the potential to affect the Proposed Development and to go on to cause immediate or delayed serious damage to one or more of the following: human health; welfare; critical infrastructure; and the environment.
- 18.1.4 Due to the nature of the Proposed Development, it will fall under a number of regulatory regimes requiring licenses and consents, the compliance with which will be externally monitored. This being the case, potential health, safety and environmental risks associated with the Proposed Development will be proactively managed via these regulatory regimes.
- 18.1.5 The list of MA&D categories and types to which the Proposed Development may be vulnerable during construction and operational phases are listed in **Table 18.1**.

Table 18.1 MA&D categories and types

Type	Category
Natural Hazards	Geophysical
	Hydrological
	Climatological and Meteorological
	Biological
Technological or Manmade Hazards	Societal
	Industrial and Urban Accidents
	Transport Accidents

Type	Category
	Pollution Accidents
	Utility Failures
	Malicious Attacks
	Engineering Accidents and Failures

- 18.1.6 This chapter should be read in conjunction with the environmental aspect chapters (**Chapter 5: Air Quality to Chapter 17: Transport and Movement**) to provide a broader environmental context of the risks associated with these MA&D events/situations. These chapters also include examples of the measures that may be used to prevent or mitigate significant effects and details of the preparedness for, and proposed response to emergencies. Measures will be identified further in the Environmental Statement (ES).
- 18.1.7 The definitions of key terms used in this chapter are given in **Table 18.2**. These definitions have been developed by reference to the definitions used in European Union (EU) and United Kingdom (UK) legislation and guidance relevant to MA&D (as set out below in **Section 18.2**), as well as professional judgement in the context of the Proposed Development.

Table 18.2 MA&D Key Terms and Definitions

Term	Definition
(Major) Accident	In the context of the Proposed Development, an event that threatens immediate or delayed serious damage to human health, welfare and/or the environment and requires the use of resources beyond those of the Applicant or their contractor(s) to respond. Serious damage includes the loss of life or permanent injury, and/or permanent or long-lasting damage to a receptor that cannot be restored through minor clean-up and restoration efforts. The significance of this effect will consider the extent, severity and duration of harm and the sensitivity of the receptor.
ALARP	"ALARP" stands for "as low as reasonably practicable". Reasonably practicable involves weighing a risk against the trouble, time and money needed to control it. Thus, ALARP describes the level to which the Health & Safety Executive (HSE) expect to see workplace risks controlled.
Adaptive Capacity	The capacity of receptors to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.
Consultation Zone	The Office for Nuclear Regulation (ONR) and the HSE set consultation distances around nuclear installations, major accident hazard (MAH) sites and MAH pipelines after assessing the risks and likely effects of major accidents at the nuclear installation/major hazard site/pipeline. The area

Term	Definition
	enclosed within the consultation distance is referred to as the Consultation Zone (CZ). The local planning authority is notified of this consultation distance and has a statutory duty to consult the ONR/HSE on certain proposed developments within that CZ.
Disaster	In the context of the Proposed Development, a naturally occurring phenomenon such as an extreme weather event (for example storm, flood, temperature) or ground-related hazard events (for example subsidence, landslide, earthquake) with the potential to cause an event or situation that meets the definition of a (major) accident, as defined above.
External Influencing Factor	A factor that occurs beyond the Site that may present a risk to the Proposed Development, e.g. if an external major event occurred (e.g. fire or a Control of Major Accident Hazards (COMAH) site major accident) it would increase the risk of serious damage to a receptor associated with the Proposed Development.
Hazard	Anything with the potential to cause harm, including ill-health and injury, damage to property or the environment; or a combination of these.
Internal Influencing Factor	A factor which occurs within the Site that may present a risk to the Proposed Development.
Magnitude of Impact	The magnitude of an impact is typically defined by the following factors: ■ Extent – the area over which an effect occurs; ■ Duration – the time for which the effect occurs; ■ Frequency – how often the effect occurs; and ■ Severity – the degree of change relative to existing conditions.
MA&D Group	A MA&D which can be grouped as either a natural hazard (disaster) or technological or manmade hazard (major accident)
MA&D Category	A set of values used to categorise events within a related parent MA&D group.
MA&D Type	A set of values used to sub-categorise events within a MA&D category
Risk	The likelihood of an impact occurring, combined with effect or consequence(s) of the impact on a receptor if it does occur.
Risk Event	An identified, unplanned event, which is considered relevant to the Proposed Development and has the potential to be a MA&D subject to assessment of its potential to result in a significant adverse effect on a receptor.
Sensitivity	The sensitivity of a receptor is a function of its value, and capacity to accommodate change reflecting its ability to recover if it is affected. It is typically defined by the following factors: ■ Adaptability – the degree to which a receptor can avoid, adapt to or recover from an effect.

Term	Definition
	■ Tolerance – the ability of a receptor to accommodate temporary or permanent change. ■ Recoverability – the temporal scale over and extent to which a receptor will recover following an effect.
Vulnerability	In the context of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (on the assessment of the effects of certain public and private projects on the environment) the term refers to the ‘exposure and resilience’ of the Proposed Development to the risk of a MA&D. Vulnerability is influenced by sensitivity, adaptive capacity and magnitude of impact.

18.2 Consultation and Engagement

- 18.2.1 There has been no specific consultation carried out in relation to MA&D at the time of writing. Engagement undertaken for CHP Phase 1 is summarised in **Table 18.3**. CHP Phase 1 comprises a Town and Country Planning Act regime application for the CHP, with determination anticipated later in 2026. The engagement undertaken on CHP Phase 1 to date is relevant to the scoping of the Proposed Development as it has informed the identification of key environmental sensitivities, stakeholder concerns and assessment approaches that are expected to remain applicable to the Proposed Development.
- 18.2.2 It is anticipated that feedback in relation to this topic and the scope of works will be gained as part of the Phase 2 EIA Scoping Opinion, and this will inform the production of the ES.

Table 18.3 Consultation and engagement to date

Body/Organisation	Date of Engagement	Key Outcomes of Discussions
Cheshire West and Chester Council (CWCC)	24 January 2025	Cheshire West and Chester Council agreed with the conclusions presented in the scoping report undertaken for CHP Phase 1 for MA&D.
Health and Safety Executive (HSE)	28 November 2024	The HSE confirmed that the land use planning consultation zones which overlap the CHP Phase 1 site are those associated with the wider SMC. The HSE also confirmed that CHP Phase 1 is not located within a safeguarding zone of an Explosives site licensed under the Explosives regulations 2014 or the Dangerous goods in harbour area regulations 2016.

18.3 Guidance

18.3.1 This chapter has, and when undertaken the assessment will, give consideration to the following guidance:

- Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management & Assessment (IEMA)): Major Accidents and Disasters in EIA: An ISEP Primer 2020 (ISEP, 2020);
- 'Green Leaves III' Guidelines for Environmental Risk Assessment and Management 2011 (Department for Environment, Food & Rural Affairs, 2011);
- Guideline - Environmental Risk Tolerability for Control of Major Accident Hazards (COMAH) Establishments 2013 (Chemical and Downstream Industries Forum, 2013);
- ISO 31000:2018 Risk Management - Guidelines 2018 (International Standards Organisation, 2018);
- Emergency Planning for Major Accidents (HSG 191): COMAH Regulations 2015;
- Further Guidance on Emergency Plans for Major Accident Hazard Pipelines;
- Reducing Risks, Protecting People: HSE's Decision Making Process;
- HSE Major Hazard Regulatory Model: Safety Management in Major Hazard Sectors;
- Chemicals and Downstream Oil Industries Forum (CDOIF) Guidelines,
- Environmental Risk Tolerability for COMAH Establishments;
- Emergency Preparedness Guidance on Part 1 of the Civil Contingencies Act 2004 (Chapter 4) (HM Government, 2006); and
- Guidance on the Interpretation of Major Accidents to the Environment for the purposes of COMAH Regulations.

18.3.2 This chapter has, and when undertaken the assessment will, give consideration to all relevant legislation.

18.4 Study Area

18.4.1 Based on professional judgement, the following factors, and associated distances from the Site, were adopted for setting the Study Area to capture internal and external influencing factors that may have high adverse consequences on the Proposed Development:

- Manmade features:

- Airports and airfields within 13km (the general safeguarding zone);
- COMAH facilities within 5km;
- Major Accident Hazard (MAH) pipelines within 1km;
- Nuclear installations within 5km (distance to The Land Use Planning Outer Consultation Zone);
- Fuel retail sites (including Liquified Natural Gas, Liquified Petroleum Gas) within 1km;
- Rail infrastructure within 500m; and
- Transmission (gas, electrical, oil/fuels) crossing the Site.
- Natural features with the potential to create risks within:
 - 3km (chiefly hydrological and geological, for example dam failure and seismic activity respectively); and
 - 1km (chiefly hydrological and geological, for example flood risk and unstable ground conditions respectively).

18.4.2 The Study Area has been based primarily on information held by the Applicant and information gathered to inform this chapter from the data sources outlined below.

18.5 Baseline Conditions

Data Sources

- 18.5.1 The baseline conditions for MA&D described in this section has been informed by the following data sources:
- National Risk Register (HM Government, 2026);
 - British Geological Survey (BGS) GeoIndex Onshore (BGS, 2020);
 - Tsunamis Hazard Map (Prevention Web Europe, 2005);
 - The International Disaster Database (Centre for Research on the Epidemiology of Disasters, 2025);
 - HSE's Planning Advice Web App (Health and Safety Executive, 2026);
 - HSE's COMAH 2015 Public Information Search (Health and Safety Executive, 2026);
 - Google aerial and street view maps (Google, 2026); and

- Environmental aspect chapters (**Chapter 5: Air Quality to Chapter 17: Transport and Movement**).

18.5.2 A summary of the baseline conditions is presented below.

Existing Baseline

18.5.3 The baseline relevant to MA&D comprises:

- features external to the Proposed Development that contribute a potential source of hazard to the Proposed Development;
- sensitive environmental receptors at risk of significant effect; and
- current (without the Proposed Development) MA&D risks for the existing locality.

18.5.4 Baseline conditions for MA&D are presented in **Table 18.4**.

Future Baseline

18.5.5 In the future baseline and in the absence of the Proposed Development, it is considered that current industrial uses within the Stanlow Manufacturing Complex (SMC) would remain.

18.5.6 Climate change may exacerbate the vulnerability of the existing SMC to major accidents and disasters due to the potential increase in the frequency, intensity, and duration of extreme weather events such as floods, droughts, heatwaves, and storms. The potential for climate change to impact upon the frequency and severity of meteorological hazards in future years is inherent within the MA&D assessment and is also considered within other technical aspect chapters such as **Chapter 10: Water Environment and Flood Risk** and **Chapter 11: Climate Resilience**.

Sensitive Receptors

18.5.7 Schedule 4 of the EIA Regulations sets out the information that should be included in an ES where that information is relevant to the specific characteristics of the development. As such, this chapter has considered the following receptors:

- members of the public and local communities;
- infrastructure and the built environment;
- the natural environment, including ecosystems, land and soil quality, air quality, surface and groundwater resources and landscape;
- the historic environment, including archaeology and built heritage; and

- the interaction between the factors above.

18.6 Description of Potential Vulnerability to Major Accident and Disaster Risks

- 18.6.1 There is no published guidance for the application of the legal requirements to the assessment of MA&D. However, selected relevant guidance for risk assessment methodologies is summarised in **Section 18.3**.
- 18.6.2 In addition to the information sources used to collate baseline information (detailed in **Section 18.5**), the following have been consulted to support the identification of potential MA&D:
- The Cabinet Office National Risk Register (2026 Edition) (HM Government, 2026) – This document is the unclassified version of the National Risk Register, and it identifies the main types of civil emergencies that could affect the UK in the next five years. It is recognised, however, that this document does not provide an all-encompassing list of all potential accidents and disasters and its timescales are short term.
 - Early Warning, Early Action (The International Federation of Red Cross & Red Crescent Societies, 2026) – This guidance looks to other countries including those in warmer climates, thereby identifying risks that the UK may encounter in the future in light of climate change and global warming.
 - The International Disaster Database (Centre for Research on the Epidemiology of Disasters, 2025) – which contains data covering over 22,000 mass disasters in the world since 1900 to the present day and aims to "*rationalise decision making for disaster preparedness, as well as provide an objective base for vulnerability assessment and priority setting*".

18.7 Scoping Process for Major Accidents and Disaster Risks

Likelihood and Consequence Events

- 18.7.1 Low likelihood and low consequence events are scoped out as these are unlikely to result in significant adverse effects; because they do not fall into the definition of a MA&D (see **Table 18.2**).
- 18.7.2 High likelihood and low consequence events are also scoped out, as they will not lead to significant adverse effects.

- 18.7.3 High likelihood and high consequence events are also scoped out, as it is assumed that existing legislation and regulatory controls would not permit the Proposed Development to be progressed under these circumstances.
- 18.7.4 The remaining events, low likelihood and high consequence events, are the subject of the MA&D assessment. Using professional judgement, the assessment identifies relevant events and determines whether a significant environmental effect is possible.

Occupational Health and Safety

- 18.7.5 In accordance with emerging EIA practice, occupational health and safety (H&S) is scoped out of this topic. Other health issues are covered in relevant environmental aspect sections of **Chapter 5: Air Quality, Chapter 6: Noise and Vibration, Chapter 10: Water Environment and Flood Risk, Chapter 14: Population and Human Health and Chapter 16: Ground Conditions and Soils**. As 'in combination' impacts, human health is also considered within **Chapter 19: Cumulative Effects** and is covered by detailed H&S legislation: The Management of Health and Safety at Work Regulations 1999 (HM Government, 1999), The Workplace (Health, Safety and Welfare) Regulations 1992 (HM Government 1992) and The Dangerous Substances and Explosive Atmospheres Regulations 2002 (HM Government, 2002).

18.8 Impacts Scoped In or Out of Further Assessment

- 18.8.1 A long list of all possible MA&D groups, categories and types has been prepared in **Table 18.4** below. This is reviewed to rule out any potential MA&D that are considered highly unlikely to occur due to the location of the Proposed Development, based on baseline information and information provided for the technical topics relevant to MA&D.
- 18.8.2 Those MA&D types that cannot be scoped out will require further assessment in the ES.
- 18.8.3 The review of the MA&D groups, categories and types identified in the Study Area, has been undertaken to inform the scoping process, summarised in **Table 18.4**. This table shows the potential vulnerability of the Proposed Development to the risk of a MA&D at the type level. A determination on whether the MA&D type is to be scoped in or out of the MA&D assessment is provided, in accordance with either phase of the Proposed Development. The phases are indicated in the table as "C" for construction and "O" for operation. The ES will provide greater assessment and justification for the topic areas scoped in and for those that are scoped out, no further assessment is considered necessary in the EIA.

Table 18.4 Elements Scoped In or Out of Further Assessment

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
Natural Hazards	Geophysical	Earthquakes	The National Risk Register states that “Significant earthquakes in the UK are rare, and an earthquake powerful enough to cause severe damage is unlikely.” (HM Government, 2026) Regional compression caused by tectonic plate movement and uplift from melting ice sheets, while contributing to some seismic activity, are not strong enough to produce earthquakes of a magnitude that would cause significant damage. The BGS acknowledges that on average, a magnitude 4 earthquake happens in Britain roughly every two years and a magnitude 5 earthquake occurs around every 10 to 20 years (BGS, 2026). The Proposed Development is not in or close to an active area. Therefore, this MA&D event type has been scoped out from further assessment in this ES.	No
Natural Hazards	Geophysical	Volcanic Activity	The Proposed Development is not in an active area, and it is highly unlikely that an ash cloud could significantly impact on any aspect of the Proposed Development. Therefore, this MA&D event type has been scoped out from further assessment in this ES.	No
Natural Hazards	Geophysical	Landslides	The Site’s topography is relatively flat. Historical landslides have not been recorded within the boundary of the Proposed Development, and the Proposed Development does not involve the formation of deep cuts or high embankments.	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			In designing the Proposed Development to applicable standards, resources and receptors would not be put at a greater risk as a consequence of the Proposed Development. Therefore, this MA&D event type has been scoped out from further assessment in this ES.	
Natural Hazards	Geophysical	Sinkholes	Bedrock geology comprises of the Chester Sandstone Formation and the Wilmslow Sandstone Formation of the Sherwood Sandstone Group of Early Triassic age. These geological formations are unlikely to be prone to the natural formation of sinkholes. There are no examples of sinkholes in the locality of the Site. Therefore, this MA&D event type has been scoped out from further assessment in this ES.	No
Natural Hazards	Geophysical	Tsunamis	The Site is located inland, outside a tsunamis risk zone. Therefore, this MA&D event type has been scoped out from further assessment in this ES.	No
Natural Hazards	Hydrological	Coastal Flooding Fluvial Flooding	Fluvial and tidal flooding has occurred previously in the council area, particularly in the areas of Ellesmere Port and Neston in the North West. Therefore, this area is vulnerable to fluvial flooding events in the future. Chapter 10: Water Environment and Flood Risk identifies that the Site is located within the Weaver Gowey Catchment floodplain, and both fluvial and tidal flood risk are present. The Stanlow Flood Alleviation Scheme protects against a 1% AEP fluvial flood event and a 0.5% AEP tidal flood event. The existing flood defences and management infrastructure include includes the Gowey Meadows, a water storage area. In addition, flood defences are	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			located along the culverted section of Gale Brook and throughout the SMC comprising concrete flood walls, tidal gates and embanked channels. The Environment Agency Flood Map for Planning illustrates the flood risk affecting the Site. The mapping indicates that the east of the Site is located within Flood Zone 1, as well as a section towards the south. The west areas of the Site and along the alignment of Gale Brook are shown to be within Flood Zone 2 and Flood Zone 3. The potential risks associated with coastal and fluvial flooding will be assessed as part of Chapter 10: Water Environment and Flood Risk in this ES. Therefore, this MA&D event type has been scoped out from further assessment from an MA&D perspective.	
Natural Hazards	Hydrological	Pluvial Flooding	Cheshire West and Chester Level 1 Strategic Flood Risk Assessment (JBA Consulting, 2016) states that surface water flooding is prevalent across the council area over the flatter ground, where surface water can accumulate. This is exacerbated by complex hydraulic interactions in the urban environment. Pluvial flooding is typically associated with events greater than the 1 in 30 year design standard of new sewer systems. Risk is also associated with network failures, blockages and collapses. Flooding clusters form around Ellesmere Port and Neston. The Environment Agency's Risk of Flooding from Surface Water mapping indicates that the majority of the Site is within a very low risk of flooding from this source (less than 0.1% chance of a flood each year). However, there are multiple small areas throughout the Site and Study Area that are located within a low risk (between 0.1% -	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			1.0% chance of a flood each year), medium risk (between 1.0% - 3.3% chance of a flood each year) and high risk (greater than 3.3% chance of a flood each year) of flooding from surface water. The mapping suggests surface water flood risk is more likely associated with localised depressions in topography, localised structures such as bunds, and exceedance of local drainage systems. Surface water drainage infrastructure is operational across the Stanlow Manufacturing Complex; however, this primarily comprises legacy engineered systems rather than a single, integrated Sustainable Drainage System designed to modern standards. While attenuation and controlled discharge mechanisms are in place and actively maintained, surface water flooding remains a residual risk. The potential risks associated with pluvial flooding will be assessed as part of Chapter 10: Water Environment and Flood Risk in this ES. Therefore, this MA&D event type has been scoped out from further assessment from a MA&D perspective.	
Natural Hazards	Hydrological	Groundwater Flooding	Available groundwater level information indicates that the groundwater levels are shallow. The site is outside of a groundwater flood alert area. According to Chapter 10: Water Environment and Flood Risk, most of the central area of the site is classified as being at 'moderate risk' for groundwater flooding. The western portion of the site falls under the 'high risk' category for groundwater flooding.	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			The potential risks associated with groundwater flooding will be assessed as part of Chapter 10: Water Environment and Flood Risk in this ES. Therefore, this MA&D event type has been scoped out from further assessment from a MA&D perspective.	
Natural Hazards	Hydrological	Avalanches	Avalanches are not considered relevant given the geographical location of the Site. The Site's topography is relatively flat and therefore an avalanche could not occur. Therefore, this MA&D event type has been scoped out from further assessment in this ES.	No
Natural Hazards	Climatological and Meteorological	Cyclones, hurricanes, typhoons, storms and gales	Cyclones, hurricanes and typhoons do not occur in the UK. The winter of 2015/2016 was the second wettest winter on record and a series of storms (including 'Desmond' and 'Eva') resulted in heavy and sustained rainfall (McCarthy M., Spillane S., Walsh S., Kendon M., 2016). 17,600 UK properties were flooded and several bridges collapsed, disrupting access to and from local communities. In April 2026 Storm Dave brought very strong winds and heavy rainfall across Scotland, Northern Ireland, northern England and north Wales. Gusts of 60–70 mph were widely recorded in exposed western and northern areas (Met Office, 2026). In August 2024, Storm Lilian brought strong winds and heavy rain to northern England and Wales, and parts of Scotland causing travel disruption and power cuts (Met Office, 2024). In January 2024, Storm Isha brought widespread strong winds, particularly across the northern half of the UK, where winds gusted at 69 to 81mph. Storm Isha caused power	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			outages, damaged buildings and fallen trees. There was also widespread transport disruption to road, rail and air (Met Office, 2024). During these historical storm events only minor damage to exposed non-structural items (e.g. lagging and insulation) was experienced at the existing SMC. In the event of a storm during the construction phase, works would be temporarily suspended, and equipment secured. The risks associated with adverse weather conditions will be considered in the Construction Design Management (CDM) Risk Register. During the operational phase, storms and gales could result in damage to energy generation infrastructure on site and could affect operation of the Proposed Development. The design takes into account environmental conditions including exposure to UK weather conditions. In addition, as part of the operational procedures, pre-adverse weather sweeps and general housekeeping routines and inspections, will ensure that all equipment is secured prior to a storm. It is therefore considered that this MA&D event type can be scoped out from further assessment in relation to both the construction and operational phases.	
Natural Hazards	Climatological and Meteorological	Thunderstorms	This type of event could result in lightning strikes to temporary elevated structures during construction (e.g. tower cranes). The risks associated with adverse weather conditions will be considered in the CDM Risk Register, including appropriate mitigation measures such as lightning protection systems.	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			It is therefore considered that this MA&D event type can be scoped out from further assessment.	
Natural Hazards	Climatological and Meteorological	Wave surges	The wider SMC is located on the bank of the Manchester Ship Canal with the River Mersey located beyond the canal. At very high tides (occurring a few days each year) tidal bores ('The Mersey Bore') can occur. This is most prominent in the lower estuary opposite Hale Point, which is located approximately 6km upstream from the Proposed Development. At the Proposed Development location, bore formation is significantly attenuated and does not result in hazardous wave action or rapid water level changes capable of initiating a major accident or disaster scenario. Therefore, this MA&D event type has been scoped out from further assessment in this ES.	No
Natural Hazards	Climatological and Meteorological	Extreme temperatures: - Heatwaves; - Low (sub-zero) temperatures; and - Heavy snow.	This type of event could give rise to changes in climatic conditions, with infrastructure exposed to greater heat intensity and exposure to sunlight. Heavy snow could cause workers to be trapped on the Site. In August 1990, the UK experienced heatwave conditions with temperatures reaching what was then a record 37.1°C in Cheltenham, England. In August 2003 a UK heatwave lasted ten days and resulted in over 2,000 deaths. Temperatures reached what was then a record 38.5°C in Faversham, England and 33°C in Anglesey, Wales. High temperature records are now being broken with increasing frequency. The most widespread and prolonged low temperatures and heavy snow in recent years occurred from December 2009 to January 2010. Daytime temperatures were mostly sub-zero across the UK. At night, temperatures in	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			England regularly fell to -5°C to -10°C. Snowfall across the UK lasted for some time, allowing 20cm to 30cm of snow to build up, closing schools and making it very difficult to travel. In the area of the Proposed Development: - between 1981 and 2010, there were ten occurrences where summer mean temperatures exceeded 25.2°C on five or more consecutive days. - between 1981 and 2010, there have been 1,573 days with a maximum minimum temperature below zero degrees Celsius. - between 1981 and 2010, there were 269 days with snow lying at 0900 however, there are no records from the Met Office of the depth of snow. During the construction phase the potential risks associated with extreme temperatures will be considered in the CDM Risk Register. During the operational phase, the existing SMC site adverse weather procedures (which will be reviewed and updated as appropriate for the CHP plant) will be implemented to ensure that the risks associated with extreme temperatures are appropriately managed. Therefore, it is considered that this MA&D event type can be scoped out from further assessment in this ES.	
Natural Hazards	Climatological and Meteorological	Droughts	Over the past 40 years or so England has experienced five long duration droughts and two shorter periods of drought. Most recently in summer 2026, a drought was declared across most of England. Cheshire was classified as an area experiencing prolonged dry weather. Potable	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			water for the area of the Site is supplied by abstraction from boreholes and reservoirs. The United Utilities Drought Plan (United Utilities, 2022) is updated every five years which aligns with a Water Resources Management Plan (United Utilities, 2019). The North West is resilient to a 1 in 200 drought event with less than 0.5% annual chance of emergency drought orders. Prolonged periods of drought can impact infrastructure as drying out and cracking of soils may affect structural stability and prolonged dry periods can lead to cracking of surfaces and more rapid deterioration of materials. Decreased rainfall combined with an increase in the average temperature can also increase subsidence. During the construction phase, the Proposed Development should not be vulnerable to drought as water is not an essential service other than for domestic purposes. Although water is required during the operational phase, this will be taken from sources that are resilient to drought. The design of the sub-structure will be resilient to ground shrinkage and this risk should remain in the design risk register until designed out. It is therefore considered that this MA&D event type can be scoped out from further assessment in this ES.	
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Solar Flares	Solar flare events are known to interrupt radio and other electronic communications. Records from solar storms in 1921 and 1960 describe widespread radio disruption and impacts on railway signalling and switching systems. During the solar storm in May 2024, reportedly there were	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			power grid irregularities and Global Positioning System (GPS) and high frequency radio communications were impacted. Further solar storm activity affected England during late 2024 and 2025, including several strong geomagnetic events that produced auroral displays, however, none exceeded the severity or impacts of the May 2024 event. Some aerial drone users flying during the storm experienced difficulty maintaining a stable hover, disruption of GPS signals, and in some cases a sudden loss of control. There were no reported significant impacts to the population. Telemetry to allow remote operation of valves and remote monitoring systems will be installed as part of the Proposed Development. However, the Proposed Development is no more vulnerable than the existing SMC or other similar infrastructure in the locality. It is therefore considered that this MA&D event type can be scoped out from further assessment in this ES.	
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Solar Energetic Particles	Solar energetic particles which cause solar radiation storms, but only in outer space, may impact satellites and communications. However, the Proposed Development is no more vulnerable than the existing SMC or other similar infrastructure in the locality. Therefore, this MA&D event type can be scoped out from further assessment in this ES.	No
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Coronal Mass Ejections	Coronal mass ejections (CME) cause geomagnetic storms. The geomagnetic storm in 2003 caused the UK aviation sector to lose some GPS functions for a day. The geomagnetic storm in 2024 caused some disruption	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			however, there was no known significant impact on infrastructure in the UK. Therefore, this MA&D event type can be scoped out from further assessment in this ES.	
Natural Hazards	Climatological and Meteorological	Fog	Fog is one of the most common weather conditions in the UK, particularly throughout autumn and winter. Severe disruption to transport occurs when the visibility falls below 50m over a wide area. It is only during the construction phase when fog may impact the Proposed Development. There would be a risk to construction workers travelling to the Site, but this risk would not be significantly different from the baseline. Workers' health and safety is also managed by Occupational Health and Safety legislation. During the construction phase, works would be paused during poor visibility conditions. It is therefore considered that this MA&D event type can be scoped out from further assessment in this ES. During operation, the risks associated with fog are no different from the current situation.	No
Natural Hazards	Climatological and Meteorological	Wildfires: Forest fire, Bush / brush, pasture	The Proposed Development is not located in, or surrounded by, significantly large areas of woodland that could be at risk of wildfire events during hot, dry periods and/or fires initiated by construction related activities. It is therefore considered that this MA&D event type can be scoped out from further assessment in this ES.	No
Natural Hazards	Climatological and Meteorological	Poor Air Quality	In 2006 the UK experienced two periods of extended hot weather with associated elevated ozone and harmful airborne particles. In the spring of 2015, two particle pollution episodes caused widespread poor air quality	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			throughout the UK, with multiple areas measuring 'High' on the Daily Air Quality Index and resulted in around 1,100 deaths due to exacerbation of pre-existing ill-health conditions. Summer 2015 also contained two elevated ozone episodes. CWCC has designated four Air Quality Management Areas (AQMAs) within its jurisdiction. The Proposed Development is located within, or immediately adjacent to, the Thornton-le-Moors Air Quality Management Area (AQMA No. 4), which was designated due to historic sulphur dioxide exceedances associated with industrial activity within the Stanlow Manufacturing Complex. Additional AQMAs exist in Ellesmere Port (Whitby Road/Station Road), Frodsham (A56/Fluin Lane), and Chester (city centre), primarily due to annual mean NO₂ levels exceeding standards, mainly attributed to road traffic. CWCC developed a Low Emission Strategy (LES) (Cheshire West and Chester, 2018) for 2018-2021 to address the health impacts of poor air quality. The LES aims to reduce nitrogen dioxide and particulate matter emissions through various methods, while still aligning with the Council's goals to minimise carbon emissions. The primary focus of the LES is to decrease traffic emissions by promoting and encouraging sustainable transportation options, including the adoption of low-emission vehicles and technologies. Increased dust emissions from construction activities and combustion related emissions from onsite plant and	

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			vehicles could affect local air quality at nearby sensitive receptors temporarily. While temporary construction-phase dust and operational combustion emissions could affect local air quality at nearby sensitive receptors, these effects will be managed through standard mitigation measures and regulated via a variation to the site's existing environmental permit. As part of this ES, a detailed air quality assessment will be undertaken, including dispersion modelling in Chapter 5: Air Quality. In addition, the Proposed Development will require a variation to the Site's existing environmental permit. Appropriate emission limits and control measures will be imposed by the Environment Agency to prevent harm to human health and ecological receptors. As such, no significant residual air-quality effects capable of resulting in a Major Accident or Disaster event are anticipated during construction or operation. This MA&D event type has therefore been scoped out from further assessment in this ES.	
Natural Hazards	Biological	Disease epidemics: ■ viral; ■ bacterial; ■ parasitic; ■ fungal; and ■ prion.	The Proposed Development is located in a developed country where the population is in general good health. The most recent disease epidemic in England was COVID-19, the first cases of which were identified in February 2020. Although no longer considered a global health emergency by The World Health Organisation, the vulnerability of the Proposed Development to a MA&D event caused by COVID-19 during construction and operation should be mitigated by the occupational health and safety processes that are implemented by both the	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			contractor and government rules and guidelines on the control of spread of COVID-19. The construction and use of the Proposed Development will not give rise to any disease epidemics. It is therefore considered that this MA&D event type can be scoped out from further assessment in this ES.	
Natural Hazards	Biological	Animal Diseases: ■ Avian influenza; ■ West Nile virus; ■ Rabies; ■ Foot and mouth; and ■ Swine fever	Low and highly pathogenic avian influenza has been recorded in poultry in the UK several times in the last ten years, most recently in the winter of 2025/26, although with no human cases reported. There was a devastating foot and mouth outbreak in 2001. However, there are no recorded foot and mouth burial pits in the Study Area. The use of the Proposed Development is not going to be the source of any animal disease epidemics. Therefore, this MA&D event type has been scoped out from further assessment in this ES.	No
Natural Hazards	Biological	Plants	Should invasive plant species be identified during ecological survey works or during construction, standard control measures will be implemented by the appointed contractor during construction to handle and dispose of any diseased plants and/or injurious weeds and prevent their spread. It is therefore considered that this MA&D event type can be scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Societal	Extensive public demonstrations which could lead	The Proposed Development is located in a developed country. England is politically stable with no direct border with countries experiencing conflicts. The Proposed Development is not considered highly controversial and	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
		to violence and loss of life.	should not lead to high profile public demonstrations. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	
Technological or Manmade Hazards	Societal	Widespread damage to societies and economies.	The Proposed Development is located in a developed country. England is politically stable with no direct border with countries experiencing conflicts. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Societal	The need for large-scale multi-faceted humanitarian assistance.	The Proposed Development is located in a developed country. England is politically stable with no direct border with countries experiencing conflicts. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Societal	The hindrance or prevention of humanitarian assistance by political and military constraints.	The Proposed Development is located in a developed country. England is politically stable with no direct border with countries experiencing conflicts. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Societal	Significant security risks for humanitarian relief workers in some areas.	The Proposed Development is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
Technological or Manmade Hazards	Societal	Famine	Famine is not relevant to the use of the Proposed Development. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Societal	Displaced population	There will be no displacement of populations as part of the Proposed Development. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Chemical Sites	There are 11 COMAH sites within a 5km radius of the Proposed Development: ■ Upper Tier - Urenco ChemPlants Ltd. ■ Upper Tier - Exloun Eastham Ltd. ■ Upper Tier - Veolia ES (UK) Ltd. ■ Upper Tier - Innospec Ltd. ■ Upper Tier - Argent Energy Holdings Ltd. ■ Upper Tier - Avanti Gas Ltd. ■ Upper Tier - Eastham Refinery Ltd. ■ Upper Tier - Essar Oil (UK) Ltd. ■ Upper Tier - Exolum Pipeline System Ltd. ■ Lower Tier - Stanlow Terminals Ltd. ■ Lower Tier - Encirc Ltd. During the construction phase the potential risk to construction workers will be identified and managed through the CDM Risk Register. Therefore, it is considered that this MA&D event type can be scoped out from further assessment during the construction phase. The potential risks to the Proposed Development associated with the presence of these COMAH sites	Yes O

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			during the operational phase will be considered further in the ES.	
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Pipelines	Due to the industrial nature of the area, there are numerous MAH pipelines within a 1km Study Area of the Site including pipelines operated by Cadent Gas Limited. Further consultation will be undertaken with the HSE as part of the ES to understand which MAH pipeline Consultation Zones overlap with the Site. The potential risks to the Proposed Development associated with the presence of these MAH pipelines during the construction and operational phase will be considered further in the ES.	Yes C & O
Technological or Manmade Hazards	Industrial and Urban Accidents	Nuclear	Nuclear sites are designed, built and operated so that the chance of accidental releases of radiological material in the UK is extremely low. The last historical major accident in the UK was Windscale in 1957. There are no nuclear sites located within a 5km radius of the Proposed Development. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Fuel storage	In December 2005 Europe's largest peacetime fire occurred at the Buncefield Oil Storage Terminal in Hemel Hempstead, England. The surrounding area was temporarily evacuated and some local businesses experienced long term disruption to operations. There are bulk fuel storage facilities within 1km of the Proposed Development. Some of these facilities are located on the wider SMC.	Yes C & O

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			There are no fuel retail sites within 1km of the Proposed Development, the closest petrol station (AS 24) is located approximately 1.7km north west. This is a sufficient distance from the Site that a fire would not have a significant impact on any part of the Site. The potential risk associated with the presence of the bulk storage facilities will be further assessed in the ES.	
Technological or Manmade Hazards	Industrial and Urban Accidents	Dam breaches	Dam breaches in the UK are rare; the last major breach was at the Cwm Eigiau dam in 1925, which caused 17 fatalities and widespread flooding. There are no reservoirs within the 3km study area. In addition, the Environment Agency Flood Risk from Reservoirs map indicates that there is a very low risk (0.1%) of flooding each year and that flooding from a dam breach of a reservoir is unlikely in this area. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Mines and storage caverns	There are no records indicating current or historical mining of any sort within the Study Area. Therefore, this MA&D event type can be scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Fires	Fires could be initiated by construction related activities which impact areas adjacent to the construction activities. During construction, standard control measures would be implemented by the appointed contractor to manage the risk of fire. There are no fuel retail sites within 1km of the Proposed Development, the closest petrol station (AS 24) is located approximately 1.7km northwest. This is a sufficient	Yes O

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			distance from the Site that a fire would not have a significant impact on any part of the Proposed Development. Within the Study Area, there is a mix of industrial warehouses, energy infrastructure, storage and commercial properties. The greatest risk of fire is associated with SMC itself and associated features such as stored hydrocarbons and chemicals which can be highly flammable. However, as required under health and safety legislation, the SMC has an emergency plan to manage the risks associated with a fire should one occur. The CDM Risk Register will consider the potential impact of fire at the SMC during the construction phase and identify any appropriate mitigation measures to address the risk. Therefore, fires associated with the construction phase can be scoped out. The risk of fires associated with the SMC impacting the Proposed Development during the operational phase will be further assessed in the ES.	
Technological or Manmade Hazards	Transport accidents	Road	Significant transport accidents occur across the UK on a daily basis, mainly on roads, and involving private and/or commercial vehicles. During construction, there will be an increase in heavy construction plant and equipment on the local road network, which may increase the risk of accidents. Construction traffic will be routed via prescribed roads that are considered to be the most suitable for the volume and composition of traffic likely to be required to construct the Proposed Development.	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			Chapter 17: Transport and Movement concludes that the operational phase is unlikely to give rise to any significant environmental traffic and transport effects due to the very low traffic movements anticipated during the operation of the Proposed Development. Therefore, this M&D event type can be scoped out from further assessment in this ES.	
Technological or Manmade Hazards	Transport accidents	Rail	The northern part of the Red Line Boundary runs adjacent to / crosses the Helsby to Hooton, via Ellesmere Port railway line. The Proposed Development would not result in any additional rail crossings or amend the location of any existing crossings. The construction and operation of the Proposed Development would not increase the risk of rail accidents occurring. The presence of the railway line will be considered in the CDM risk register and where appropriate, mitigation measures required for construction activities will be identified and implemented. The existing operational risk assessments for the wider SMC consider the potential risks associated with the presence of the railway line. These risk assessments will be reviewed and updated prior to operations commencing and if necessary, additional mitigation measures will be implemented. Therefore, this MA&D event type has been scoped out from further assessment in the ES	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
Technological or Manmade Hazards	Transport accidents	Waterways	The SMC is situated on the south bank of the Manchester Ship Canal which is used to transport oil via a vessel for refining and chemicals. The construction and operation of the Proposed Development would not increase the risk of waterway accidents occurring. In addition, the risk is no different to the existing risk associated with the presence of the SMC. Therefore, this MA&D event type has been scoped out from further assessment in this ES.	No
Technological or Manmade Hazards	Transport accidents	Aviation	There have been no major air accidents in the UK since the Kegworth incident in 1989. There is one working airfield within the Study Area. Liverpool John Lennon Airport is located approximately 6.7km north of the Proposed Development. During construction the height of construction equipment (e.g. cranes) could potentially increase the risk to aircraft operating into/out of the airport. The Public Safety Zone (PSZ) associated with the airport is currently unknown. Therefore, consultation will be undertaken with Liverpool John Lennon Airport to understand the extent of the PSZ and any restrictions associated with the construction phase of the Proposed Development such as crane heights and lighting requirements. Therefore, this MA&D event type has been scoped in during the construction phase for further assessment in the ES. During operation, the risks associated with the presence of the Proposed Development should be no greater than the current situation with the existing SMC. Therefore, it is considered that the risk of aviation transport accidents	Yes C

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			can be scoped out from further assessment in the ES during the operational phase.	
Technological or Manmade Hazards	Pollution accidents	Air	Increased dust emissions from construction activities and traffic could lead to potential loss of amenity at sensitive receptors. Traffic management measures may result in both positive and adverse changes to emissions from vehicle exhausts and roadside pollution concentrations. Emissions from mobile plant and equipment are covered under H&S and environmental legislation. The Proposed Development is expected to result in changes to emissions which require a variation to the Site's existing environmental permit. In the determination of the proposed variation to the permit, the Environment Agency will set emission limits to air together with the requirement to implement appropriate mitigation measures to prevent harm to environmental receptors. Therefore, significant residual air quality effects which could result in a MA&D event are not anticipated during construction and operation of the Proposed Development. It is therefore considered that this MA&D event type can be scoped out from further assessment in this ES.	No
Technological or Manmade Hazards	Pollution accidents	Land	Chapter 16: Ground Conditions and Soils identifies that there is the potential to mobilise contaminants during the construction phase. During the construction phase there may also be an increase in the risk of leaks and spillages of hazardous materials associated with the construction activities. These risks associated will be assessed in Chapter 16: Ground Conditions and Soils of the ES and considered in the CDM Risk Register with appropriate mitigation measures identified. Chapter 16:	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			Ground Conditions and Soils states that to mitigate any potential operation effects, the proposed future use will include appropriate permanent drainage design to reduce contamination migrating to the underlying ground or sensitive watercourses. It is therefore considered that this MA&D event type can be scoped out from further assessment in the ES.	
Technological or Manmade Hazards	Pollution accidents	Water	Chapter 16: Ground Conditions and Soils identifies that the superficial deposits of glacial till are designated as unproductive strata and the bedrock geology, Chester Formation is classified as a Principal Aquifer. Groundwater is principally present within the Chester Formation. Several on Site extraction boreholes are present, and the extraction volumes are known to affect the groundwater elevations within the aquifer. The Site is not located within a Source Protection Zone (SPZ). The nearest zone is an SPZ Total Catchment Zone 3 located 3.5km east of the Site and relates to Helsby Pumping Station. During the construction phase there may be an increase in the risk of leaks and spillages of hazardous materials associated with the construction activities. However, standard control measures would be implemented by the appointed contractor to manage the risk of spillages and leaks. During the operational phase, potentially polluting materials will be provided with appropriate secondary containment measures and the drainage system will reduce the likelihood of contamination migrating into the groundwater.	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			It is therefore considered that this MA&D event type can be scoped out from further assessment in this ES.	
Technological or Manmade Hazards	Utilities failures	Electricity	Instances of electricity failure (also referred to as power loss or blackout) can be caused by a number of things, such as severe weather (e.g. very strong winds, lightning and flooding) which damage the distribution network. These tend to be mainly specific place, local (e.g. metropolitan area) and less frequently regional (e.g. North East) as a result of severe winter storms and consequent damage to the distribution overhead line network. Detailed information on the utilities which are located in the Site are not currently available. Therefore, this MA&D event type has been scoped in for further assessment in the ES.	Yes C & O
Technological or Manmade Hazards	Utilities failures	Gas	Underground gas transmission pipelines are present across the Site Boundary, the responsibilities of which lie with the relevant local operator or company should this infrastructure fail. Information regarding diversion works will be presented in the ES. The potential risk of construction-related incidents when undertaking diversion works as part of the Proposed Development will be assessed further in the ES. Operationally, this CHP will be reliant on the gas supply. Therefore, this MA&D event type has been scoped in for further assessment in the ES.	Yes C & O

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
Technological or Manmade Hazards	Utilities failures	Water supply	There is no potable water use associated with the Proposed Development during its operation and relatively low use during construction, which could be addressed by tankering in supplies if required. The operation of the CHP plant will require the use of water for steam generation. In the event of loss of water supply, the plant will be safely shut down. It is therefore considered that this MA&D event type can be scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Utilities failures	Sewage system	There is no use of the sewage system associated with the Proposed Development other than domestic waste water from the welfare facilities. During the construction phase temporary portable systems will be in place covered by H&S welfare requirements. It is therefore considered that this MA&D event type can be scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Malicious Attacks	Unexploded Ordnance	The Zetica Risk Maps indicate that the risk of encountering unexploded ordnance (UXO) in the Study Area is low. In addition, as this Site has previously been developed the likelihood of encountering UXO is further reduced. The risks associated with potentially encountering UXO will be considered in the CDM Risk Register. Measures would be undertaken during construction to brief operatives to raise awareness of this issue, and to define appropriate response strategies should this be discovered during the works.	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			There would be a limited risk of UXO affecting the Proposed Development, once operational but no greater than the existing SMC and other similar developments. It is therefore considered that this MA&D event type can be scoped out from further assessment in the ES	
Technological or Manmade Hazards	Malicious Attacks	Attacks: - Chemical; - Biological; - Radiological; and - Nuclear.	Extremists remain interested in Chemical, Biological, Radiological and Nuclear (CBRN) materials, however alternative methods of attack such as employing firearms or conventional explosive devices remain far more likely. Historical use has been in closed densely occupied structures (underground, buildings) or targeted at specific individuals. The Proposed Development is unlikely to be a target for this type of event due to the low number of exposed targets. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Malicious Attacks	Transport systems	Potential systems would include (but are not limited to) railways, buses, passenger ferries, cargo vessels and aircraft. The Proposed Development is unlikely to be a target for this type of event due to the low number of exposed targets. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Malicious Attacks	Crowded places	The Proposed Development does not fall within the definition of a crowded place, i.e. pedestrian routes and other thoroughfares as well as sports arenas, retail outlets and entertainment spaces.	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			Therefore, this MA&D event type has been scoped out from further assessment in the ES.	
Technological or Manmade Hazards	Malicious Attacks	Cyber	Cyber-attacks occur almost constantly on key national and commercial electronic information, control systems and digital industries. The reliance on telemetry for remote monitoring could render the Proposed Development more vulnerable to a cyber-attack. Notwithstanding this, it is not considered to be more vulnerable to attack than similar infrastructure installed and running on the existing SMC and elsewhere in the UK. It is therefore considered that this MA&D event type can be scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Malicious Attacks	Infrastructure	Terrorists in the UK have previously attacked, or planned to attack, national infrastructure. Attempts were made to attack electricity substations in the 1990s. Bishopsgate, in the City of London, was attacked in 1993 and South Quay in London's Docklands in 1996. These attacks resulted in significant damage and disruption but relatively few casualties. The Proposed Development is potentially vulnerable to attack. However, it is not considered to be more vulnerable to attack than similar infrastructure installed and running on the existing SMC. Therefore, this MA&D event type has been scoped out of further assessment in the ES.	No
Technological or Manmade Hazards	Engineering accidents and failures	Bridge failure	Bridge works are not proposed as part of the Proposed Development. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
Technological or Manmade Hazards	Engineering accidents and failures	Flood defence failure	Chapter 10: Water Environment and Flood Risk identifies that there are flood defences along the culverted section of Gale Brook and throughout the SMC. These flood defences are made up of concrete flood walls, tidal gates and embanked channels through the oil refinery complex. Maintenance of these defences is undertaken by the flood defence owner. The design of the Proposed Development has been developed to include allowances for future climate change predictions that could result in flooding. The potential risk of breach events will be considered in the Flood Risk Assessment as part of the ES. Therefore, this MA&D event type has been scoped out from further assessment in the ES from a MA&D perspective.	No
Technological or Manmade Hazards	Engineering accidents and failures	Mast and tower collapse	There are no towers or masts in close proximity to the Proposed Development or being built as part of the Proposed Development. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No
Technological or Manmade Hazards	Engineering accidents and failures	Property or bridge demolition accidents	The Proposed Development involves the demolition of some redundant buildings and structures. The risks of accidents occurring during these works would be taken into account by the appointed contractor and considered as part of their detailed methodology and risk assessments in advance of these works as required under the CDM Regulations 2015 (HM Government, 2015). Surveys would be undertaken prior to the demolition of buildings and structures to confirm whether	No

MA&D Group	MA&D Category	MA&D Type	Basis of Decision to Scope In/Out	Scope In? Phase
			any potential harmful substances (e.g. asbestos) are present, and to determine the risk to people. Therefore, it is considered that this MA&D event type can be scoped out from further assessment in the ES.	
Technological or Manmade Hazards	Engineering accidents and failures	Tunnel failure/fire	There are no tunnel structures proposed as part of the Proposed Development or within the Study Area. Therefore, this MA&D event type has been scoped out from further assessment in the ES.	No
Note: C = Construction, O = Operation				

18.8.4 To summarise the following MA&D types have been scoped in for further assessment in the ES:

- Construction and operational phase:
 - Major Accident Hazard Pipelines (industrial and urban accidents);
 - Fuel storage (industrial and urban accidents);
 - Electricity (utilities failure); and
 - Gas (utilities failure).
- Construction phase:
 - Aviation (transport accidents).
- Operational phase:
 - Major Accident Hazard Chemical sites (industrial and urban accidents); and
 - Fires (industrial and urban accidents).

18.9 Mitigation Measures

18.9.1 Relevant embedded mitigation measures for the construction and operational phases will be identified in the ES, and these may include:

- compliance with applicable regulatory regimes such as COMAH;
- good engineering practice;
- environmental, health & safety management;
- supplier management environmental, health and safety standards (e.g. Construction Skills Certification Scheme);
- risk management systems; and
- an Outline Code of Construction Practice (CoCP) (construction phase only).

18.9.2 This assessment assumes that embedded mitigation measures identified in each of the technical aspect chapters (**Chapter 5: Air Quality** to **Chapter 17: Transport and Movement**) will be implemented for the Proposed Development, in order to assess the magnitude of impact.

18.10 Assessment Methodology

18.10.1 In line with the ISEP Primer (ISEP, 2020), for those MA&D types which have been scoped in for detailed assessment in the ES, the proposed assessment process to be used in the ES will include:

- identifying potential risk events related to the scoped in MA&D types;
- screening these risk events, e.g. to remove unrealistic worst-case scenarios;
- defining the likely worst-case consequences (impact);
- assessing the likelihood; and
- determining whether the risk event could be a MA&D and, if relevant, whether the risk is As low as reasonably practicable (ALARP) with the proposed mitigation measures.

Significance Criteria

- 18.10.2 By definition, a major accident and/or disaster would have a major significant effect on the environment (including human health, welfare and/or the environment). Accordingly, any risks that could result in a MA&D without suitable mitigation, management or regulatory controls in place will be assessed as significant in the context of EIA.

18.11 Assumptions and Limitations

- 18.11.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:
- The design of the Proposed Development will be subject to relevant hazard identification studies and actions identified will be integrated into the final design, to reduce risks to ALARP.
 - The construction phase of the Proposed Development will be managed through the implementation of the construction phase plan required under the CDM Regulations 2015 (as amended) (HM Government, 2015) and an Outline CoCP.
 - The Proposed Development is being designed, and its implementation guided by other industry standards and codes, many of which are mandatory. These require infrastructure and systems to be designed so that risks to people and the environment are either eliminated or reduced to levels that are ALARP.
 - Environmental effects associated with unplanned events that do not meet the definition of a MA&D (e.g. minor leaks and spills that may be contained within the construction sites) are addressed in other environmental aspect chapters as appropriate and not in this chapter.
 - It is recognised that the management framework for the Proposed Development is not fully defined at this stage; however, a presumption of standard practice and regulatory compliance within the adopted management framework has been assumed and will be developed following the appointment of the appointed contractor.

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EET Fuels

Stanlow Hydrogen Ready Combined Heat and Power Project Development Consent Order

**Environmental Impact Assessment Scoping Report –
Chapter 19: Cumulative Effects**

02-09-2026

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Appendix 19.1 Draft Long List of Other Developments

19. Cumulative Effects

19.1 Introduction

- 19.1.1 This chapter outlines the proposed approach to the assessment of cumulative effects that will be presented in a chapter in the Environmental Statement (ES).
- 19.1.2 The following types of cumulative effects will be considered in the ES:
- Inter-project effects – the residual environmental effects of the Proposed Development combining and interacting with the residual environmental effects of other committed development(s), affecting the same receptor. For example, traffic effects upon users of the local road network because of the Proposed Development and other developments.
 - Intra-project effects – the interaction and combination of different residual environmental effects of the Proposed Development affecting the same receptor. For example, visual and noise effects during construction affecting nearby Public Right of Ways (PRoWs).
- 19.1.3 The Environmental Impact Assessment (EIA) Regulations require that, in assessing the effects of a particular development, consideration should also be given to the effects that may arise from the Proposed Development in conjunction with other existing and/or approved developments (inter-project effects), and the effects that may arise from interactions between the impacts identified for the Proposed Development (intra-project effects).
- 19.1.4 Schedule 4, Paragraph 5 states the following:
- ‘A description of the likely significant effects of the development on the environment resulting from, inter alia -*
- (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’*
- 19.1.5 Under the EIA Regulations, it also states that intra-project effects should be considered as per Regulation 5, paragraph (2) *‘the EIA must identify, describe and assess in an appropriate manner.... (e) the interaction between the factors referred to in sub-paragraphs (a) to (d)’*.

19.2 Study Area

Inter-project Effects

- 19.2.1 A study area of 10km is currently proposed. This study area, otherwise referred to as the 'Zone of Influence (ZOI)' for the purposes of the inter-project effects assessment, has been selected based upon the largest study area identified within the other technical chapters of this scoping report.
- 19.2.2 The ZOI excludes consideration of Greenhouse Gases (GHG) because consideration of cumulative GHG emissions will be inherent in the assessment, as the GHG emission of the Proposed Development will be assessed against various contextual scales, such as sector and local authority policies and the United Kingdom's carbon budgets. Major accidents and disasters will also not be considered in the cumulative effects chapter of the ES due to the major accidents and disasters' assessment covering external factors, including other development, by its very nature, therefore its study area is not relevant in the selection of a ZOI.
- 19.2.3 Similarly, while socioeconomics will be considered in the inter-project effects assessment, its study areas are not considered because they cover local, regional and national level which are not proportionate for the selection of a ZOI.

Intra-project Effects

- 19.2.4 No specific study area applies to the intra-project effects assessment. It will be informed by the study areas defined for each of the scoped-in environmental topics.
- 19.2.5 There is no established EIA methodology for assessing and quantifying effect interactions that lead to combined effects on sensitive receptors; however, the European Commission (EC) has produced guidelines for assessing effect interactions "*which are not intended to be formal or prescriptive but are designed to assist EIA practitioners in developing an approach which is appropriate to a project¹...*".

19.3 Assessment Methodology

- 19.3.1 The assessment will be qualitative and based on available information. Partially quantitative assessments may be undertaken for some elements where practicable, such as for traffic related or material & waste effects. Where information is not available, professional judgement will be used to determine if a

¹ European Commission (EC), (1999). *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*. Luxembourg: Office for Official Publications of the European Communities.

worst case approach can be applied. All assumptions and limitations will be clearly stated in the ES chapter.

Inter-project Effects

- 19.3.2 There is no widely accepted methodology or best practice for the assessment of inter-project effects, although there are several guidance documents available, including the Planning Inspectorate's Advice on Cumulative Effects Assessment (UK Government, 2025). This guidance specifically applies to Nationally Significant Infrastructure Projects (NSIPs) and will therefore inform the approach taken to the inter-project effects assessment. The approach to assessing inter-project effects will also be based on professional judgement, the types of receptors being assessed and the nature of the Proposed Development.
- 19.3.3 The assessment methodology for inter-project effects will involve the identification of incremental changes to baseline conditions likely to be caused by other relevant projects together with the Proposed Development. In line with the Planning Inspectorate's Advice on Cumulative Effects Assessment, the assessment will involve the following key stages.

Stage 1 – Identification and Evaluation of Developments for Consideration

- 19.3.4 Stage 1 of the approach requires the identification of a ZOI for the Proposed Development and the identification of other, reasonably foreseeable developments within the ZOI. These projects are termed 'Other Developments'.
- 19.3.5 As outlined in **paragraph 19.2.1**, at the time of writing, a draft maximum ZOI has been determined, based on the maximum expected Study Area for affected receptors. In the case of the Proposed Development this has been determined as 10km from **Chapter 7: Biodiversity**, related to internationally designated sites.
- 19.3.6 Other Developments will be identified through an initial search conducted within the identified ZOI of the following:
- planning registers of the local planning authorities (Cheshire West and Chester Council (CWCC), Halton Borough Council, Knowsley Borough Council, Liverpool City Council and Wirral Borough Council);
 - Planning Inspectorate's planning register; and
 - any relevant development plans.
- 19.3.7 A 'long list' of Other Developments will be prepared to include selected developments within the ZOI. For the selection of Other Developments, the following criteria will be considered ahead of inclusion in the long list:

- those within the maximum ZOI for the Proposed Development (10km);
- developments of a size considered to have the potential to result in an inter-project effect; and
- developments added to the planning system within the last five years, or developments added more than five years ago where there are ongoing changes to the original application displayed on a planning register (for example, a Non-Material Amendment application or a Discharge of Conditions).

19.3.8 Developments which are not considered to result in an inter-project effect will be excluded from the long list. Although each development will be considered on a case-by-case basis, generally those which fall within the following criteria will not be added to the long list:

- any planning applications older than five years at the commencement date of the assessment (unless they fit the criterion stated above);
- construction of small-scale agricultural buildings;
- house extensions or cosmetic changes to buildings;
- work to trees;
- micro-generation wind turbines;
- roof mounted solar photovoltaic (PV) panels (or ground mounted less than 50 kilowatts (kW) output);
- renewal of planning permission for retention of existing operational use;
- variation to planning permission for retention of existing operational use;
- variation to planning permissions, including reserved matters applications (where the original application would not have been considered within the assessment);
- small-scale residential uses (specifically, less than 20 dwellings); and
- changes of buildings' use (unless it could itself result in a cumulative effect, such as a conversion of several barns into a holiday village).

19.3.9 The Long-List will be sent to the relevant local planning authorities for comment and agreement will be sought prior to progressing to Stage 2. The relevant local planning registers are as follows:

- CWCC;
- Halton Borough Council;
- Knowsley Borough Council;

- Liverpool City Council; and
- Wirral Borough Council.

- 19.3.10 As outlined in **paragraph 19.2.1**, at the time of writing, a draft maximum ZOI has been determined, based on the maximum expected Study Area for affected receptors. In the case of the Proposed Development this has been determined as 10km from **Chapter 7: Biodiversity**, related to internationally designated sites.
- 19.3.11 A draft long list has been produced (see **Appendix 19.1: Draft Long List of Other Developments**) and will be sent to the above local authorities and the Planning Inspectorate (PINS) to provide comment on this draft long list as part of the review of the Scoping Report and the preparation of the Scoping Opinion.
- 19.3.12 Each development has been assigned a tier based upon the stage of the Other Development and the level of information available. This approach is published within the Planning Inspectorate's Advice on Cumulative Effects Assessment and has been reproduced in **Table 19.1**.

Table 19.1 Other Developments' Degree of Certainty

Tier	Factors attributing to degree of certainty	Decreasing level of detail likely to be available
Tier 1	- under construction; - permitted application(s) but not yet under construction; and - submitted application(s) but not yet determined. Environmental assessment equating to that of an EIA or extensive bespoke assessments on environmental topics.	
Tier 2	Projects on the PINS/Developments of National Significance's (DNS) Register of Projects.	
Tier 3	- projects on the PINS/DNS Register of Projects where an EIA Scoping Request has not been submitted; - local development plan allocations (adopted and emerging) with appropriate weight being given as they move closer to adoption; and - identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals.	

19.3.13 The draft long list will be reviewed and updated at the ES stage ahead of progressing to Stage 2, to ensure that the search of Other Developments is as up to date as practicable. The long list will be updated throughout the ES stage, being finalised at a date ahead of submission of the ES. This date will be determined and outlined in the ES but, based on professional experience, is expected to be six months before submission of the ES to allow sufficient time for information gathering and preparation of the inter-project effects assessment.

Stage 2 – Identify a Shortlist of Other Developments

19.3.14 The long list will then be refined to a 'shortlist' by reviewing each of the 'Other Developments' identified against the following criteria:

- Is there a concurrent construction or operational phase between the Other Development and the Proposed Development?

- Is there sufficient information relevant environmental information for the Other Development, in order to identify common receptors and/or inter-project effects?

Stage 3 – Identification of Information for the Other Developments

- 19.3.15 Information on Other Developments included within the shortlist will be gathered from available third-party information sources within the public domain.
- 19.3.16 The information captured should include, but not necessarily limited to:
- proposed design and Site Boundary information;
 - proposed programme of construction and operation; and
 - technical information that sets out baseline data and effects arising from the Other Development on the same sensitive receptors as those identified within the ES.
- 19.3.17 The inter-project effects assessment is an iterative process therefore, depending on the outcome of information gathering and reviewing it against information presented in the ES, some shortlisted developments may not be progressed to Stage 4 for further assessment. Justification for excluding any Other Developments from Stage 4 will be explained in the ES.

Stage 4 – Assessment of Inter-Project Effects

- 19.3.18 The assessment of inter-project effects will consider the deviation from the baseline conditions at common receptors because of changes brought about due to the Proposed Development in combination with one or more Other Developments in the shortlist.
- 19.3.19 The assessment of the inter-project effects will be based upon the residual effects identified in the technical assessments of the ES, as well as available environmental information for the Other Developments.
- 19.3.20 The assessment of inter-project effects will consider the following:
- combined magnitude of change;
 - sensitivity/value/importance of the common receptor to change; and/or
 - duration and reversibility of effect.
- 19.3.21 Through a combination of the qualitative evaluation presented in the ES and the environmental information available for Other Developments, conclusions will be drawn as to the likelihood for significant inter-project effects, i.e. those over and above, or different to, those identified for the Proposed Development on its own.

- 19.3.22 If significant residual inter-project effects are identified necessary mitigation measures will be proposed in the ES.

Significance Criteria

- 19.3.23 The significance classifications for inter-project effects are detailed in **Table 19.2** below. Moderate and above categories are considered to be significant.

Table 19.2 Inter-Project Effects Significance Criteria

Significance Category	Definition of Effect
Major	Adverse or Beneficial effects recognised to be very important considerations as significant magnification of effects on receptors/resources is likely to occur.
Moderate	Adverse or Beneficial effects that are unlikely to become issues, but where future work may be needed to improve on current performance as significant magnification of effects on receptor/resource is likely to occur if such work is not undertaken.
Minor	Adverse or Beneficial effects that are locally significant and would be unlikely to lead to a significant magnification of effects on a receptor/resource.
Negligible	No effects or effects that are beneath the level of perception, within normal bounds of variation or within the margin of forecasting error.

Intra-project Effects

- 19.3.24 The assessment of intra-project effects will be based on the information and Study Areas within the technical chapters. This assessment considers any residual effects that are reported as Minor or above within the technical chapters. Minor effects, while not significant, are considered in the assessment on the basis that multiple minor effects may interact to result in a significant effect. Negligible residual effects reported in the technical chapters are considered unlikely to accumulate to the extent that a significant intra-project effect would occur.
- 19.3.25 The assessment methodology for intra-project effect will involve the following key stages.

Stage 1 – Screening of Sensitive Receptors

- 19.3.26 A screening of sensitive receptors (as identified in each technical chapter) will be undertaken to determine whether any has the potential to be exposed to more than one type of residual effect (within an individual technical assessment and/or across multiple technical assessments) during either the construction or

operational phases of the Proposed Development. These sensitive receptors are termed 'common receptors' and will be taken forward to Stage 2 of the assessment.

Stage 2 – Determine Common Receptor's Residual Effects

- 19.3.27 Of the common receptors identified in Stage 1, those that have two or more non-negligible residual effects will be identified and taken forward to Stage 3 of the assessment.

Stage 3 – Assessment of Intra-project Effects

- 19.3.28 An assessment of the overall significance of the intra-project effect on common receptors identified at Stage 2 will be undertaken. The assessment will be based on information provided within the technical assessments, as well as professional judgement.

Significance Criteria

- 19.3.29 The significance classifications for intra-project effect are detailed in **Table 19.3** below. Moderate and above categories are considered to be significant.

Table 19.3 Intra-Project Effects Significance Criteria

Significance Category	Definition of Effect
Major	Adverse or Beneficial effects that are a significant magnification of potentially wide ranging effects on receptors/resources that are already predicted to occur.
Moderate	Adverse or Beneficial effects that are a significant magnification of localised effects on receptors/resources that are already predicted to occur.
Minor	Adverse or Beneficial effects that would only lead to a localised (not significant) magnification of effects on a receptor/resource.
Negligible	No effects or effects that are beneath the level of perception, within normal bounds of variation or within the margin of forecasting error.

19.4 Next Steps

- 19.4.1 The assessment of intra-project effect will be carried out and presented in the ES.
- 19.4.2 For inter-project effects, Stages 2 to 4 of the assessment, as described above, will be carried out and presented in the ES. The draft long list (Stage 1) will also be updated to ensure a comprehensive long list at the time of writing the ES. The

draft long list will be shared with PINS and the identified local authorities for comment.

19.5 Assumptions and Limitations

19.5.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The assessment of intra-project effects resulting from the Proposed Development will focus on the residual effects from the construction and operational phases following the implementation of additional mitigation measures.
- The assessment of inter-project effects will be based on the interpretation and assessment of publicly available data. Although information may be available for Other Developments, it may be limited in its compatibility where different assessment methodologies or criteria have been used in the technical assessments. Where this occurs and limits and/or prevents the inter-project effects assessment, it will be stated in the ES.
- There may be cases where Other Developments screened into the shortlist present information for only some of the technical topics. In such instances, the inter-project effects assessment for the given Other Developments may be limited to topics for which there is appropriate information available. This will be avoided where practicable with efforts made to make an assessment based upon the available information, assumptions and professional judgement. This will be stated in the ES where appropriate.

References

The Infrastructure Planning (Environmental Impact Assessment) Regulations, (2017). (2017 No. 571). Available online at: <https://www.legislation.gov.uk/ukxi/2017/571/contents> (Accessed: June 2026).

Planning Inspectorate, (2025). *Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment*. Available online at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment> (Accessed: June 2026).

