Keuper Gas Storage Project

Preliminary Environmental Information Report – Introduction

PREPARED FOR
Keuper Gas Storage Limited

DATE
September 2025

REFERENCE
EN0310001

DOCUMENT DETAILS

DOCUMENT TITLE	Keuper Gas Storage Project
DOCUMENT SUBTITLE	Preliminary Environmental Information Report – Introduction
PROJECT NUMBER	EN0310001
DATE	September 2025
VERSION	1.0
AUTHOR	ERM
CLIENT NAME	Keuper Gas Storage Limited

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ACRONYMS AND ABBREVIATIONS

Acronym	Description
CEA	Cumulative Effects Assessment
DCO	Development Consent Order
DESNZ	Department for Energy Security and Net Zero
EIA	Environmental Impact Assessment
ERM	Environmental Resources Management Ltd.
ES	Environmental Statement
GPP	Gas Processing Plant
HAGI	Hydrogen Above Ground Installation
KGSL	Keuper Gas Storage Limited
KGSP	Keuper Gas Storage Project
MC	Material Change
NMC	Non-Material Change

Acronym	Description
NSIP	Nationally Significant Infrastructure Project
NTS	National Transmission System
PEIR	Preliminary Environmental Information Report
SMC	Solution Mining Compound
UHS	Underground Hydrogen Storage

1. INTRODUCTION

1.1 PURPOSE OF THIS REPORT

1.1.1.1 Keuper Gas Storage Limited (KGSL) (hereafter referred to as 'the Applicant') is proposing a Material Change (MC) to the Keuper Gas Storage Project (KGSP) to construct and operate an underground hydrogen storage facility on and under land in the Holford Brinefield, Middlewich in the County of Cheshire (hereafter referred to as 'the Proposed Development').

1.1.1.2 This Preliminary Environmental Information Report (PEIR) has been prepared by Environmental Resources Management Ltd (ERM). This PEIR presents the preliminary environmental information and the preliminary findings of the Environmental Impact Assessment (EIA) undertaken to date which is reasonably required for consultees to develop an informed view of the likely significant environmental effects of the Proposed Development. This PEIR also captures and addresses all of the key statutory consultation responses within the Scoping Opinion to each of the environmental considerations for the Proposed Development.

1.1.1.3 Pursuant to Regulation 11 of the Infrastructure Planning EIA Regulations 2011 and Regulation 22 of the EIA Regulations 2017, KGSL will carry out consultation for a period commencing in October 2025 and ending in November - a six-week period. This will provide all consultees with an opportunity to provide feedback and comments on the Proposed Development and findings of the PEIR.

1.2 PROJECT HISTORY

1.2.1 DEVELOPMENT CONSENT ORDER (DCO)

1.2.1.1 The Keuper Underground Gas Storage Facility Order 2017 (Ref EN030002) was made on 15 March 2017 and came into force on 5 April 2017. The original Nationally Significant Project (NSIP) proposed to build an underground natural gas storage facility consisting of 19 salt caverns and associated gas treatment and transfer facilities for connection to the national gas transmission network.

1.2.1.2 The DCO was submitted to the Secretary of State for Business, Energy and Industrial Strategy (BEIS, now DESNZ – Department for Energy Security and Net Zero) in December 2015 and was granted in March 2017. A Correction Order was made later in 2017 to correct minor errors.

1.2.1.3 The DCO as it stands following the original consent order and the amendment order will be referred to as 'the Consented Development' throughout this report.

1.2.2 NON-MATERIAL CHANGE

1.2.2.1 Following the Consented Development, the need for hydrogen gas storage within the UK to support the storage of excess renewable electricity ('British Energy Security Strategy'[1]) has grown. In support of the UK's efforts to decarbonise and achieve net zero emissions by 2050, KGSL have been working towards an amendment to the Consented Development to allow for large-scale underground hydrogen storage (UHS). This will support regional and national ambitions for decarbonisation by providing essential low carbon energy storage capacity. In particular, the storage of hydrogen at the Proposed Development Site will form an important part of the HyNet consortium for hydrogen generation and supply in the North West of England and Wales.

1.2.2.2 A Non-Material Change (NMC) application to the Consented Development was submitted to the Planning Inspectorate and Secretary of State in November 2022. The NMC sought to amend the Consented Development to enable the storage of hydrogen gas, alongside an alternative gas connection compound and amendment to the siting and layout of an office building. A decision on the NMC application was provided by the Secretary of State in May 2024. The decision was not successful in granting consent for the NMC to facilitate hydrogen storage due to the Secretary of State's opinion that the Applicant had not provided sufficient information to confirm the change was non-material. Other minor amendments were granted, and an Amendment Order was made by Government in May 2024 (S.I.2024/674).

1.2.2.3 The Secretary of State for Energy Security and Net Zero confirmed in a letter on 15 May 2024 they did not consider the changes relating to hydrogen to be non-material. Therefore, the changes cannot be dealt with under the procedure for a non-material change to a DCO. Following discussions between the Applicant and the Planning Inspectorate in January 2025, it was determined that the consenting route for the Proposed Development would be a MC to the Consented Development.

1.3 SUMMARY OF THE PROPOSED MATERIAL CHANGE AMENDMENT

1.3.1.1 The key changes to the key components for the Proposed Development are:

- the proposed storage of hydrogen gas rather than natural gas, including consolidation of pipelines;
- changes to the Gas Processing Plant (GPP) area and hydrogen compatible equipment, including a flare instead of a vent;

[1] UK Government (2022). British Energy Security Strategy. Available online at: https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

- moving non-hydrogen equipment to a utility compound adjacent to the GPP;
- the National Transmission System (NTS) for natural gas is being replaced by the Hydrogen Above Ground Infrastructure (HAGI) for connection to the HyNet Hydrogen Pipeline; and
- changes to elements of the Solution Mining Compound (named 'SMC3' in the Consented Development).

1.3.1.2 Full details of the proposed changes are discussed in **Chapter 2, Proposed Development Description**.

1.4 PROPOSED DEVELOPMENT LOCATION

1.4.1.1 The Proposed Development is solely located within the Holford Brinefield, in Cheshire, approximately 3 km west of the M6 and approximately 3 km north of Junction 18 which is shown below on **Figure 1.1**. The Proposed Development is bounded to the west by the A530 (King Street) and to the east by the B5081. The nearest village is Byley, 2.5 km to the east.

1.4.1.2 The Proposed Development and all the proposed amendments are still contained within the Site Boundary for the Consented Development (as shown below on **Figure 1.2**). The Consented Development includes works at Holford Brinefields and three satellite sites; Lostock Works, Whitely Pumping Station and Runcorn.

1.4.1.3 All of the changes for the Proposed Development will be contained within the Holford Brinefields area.

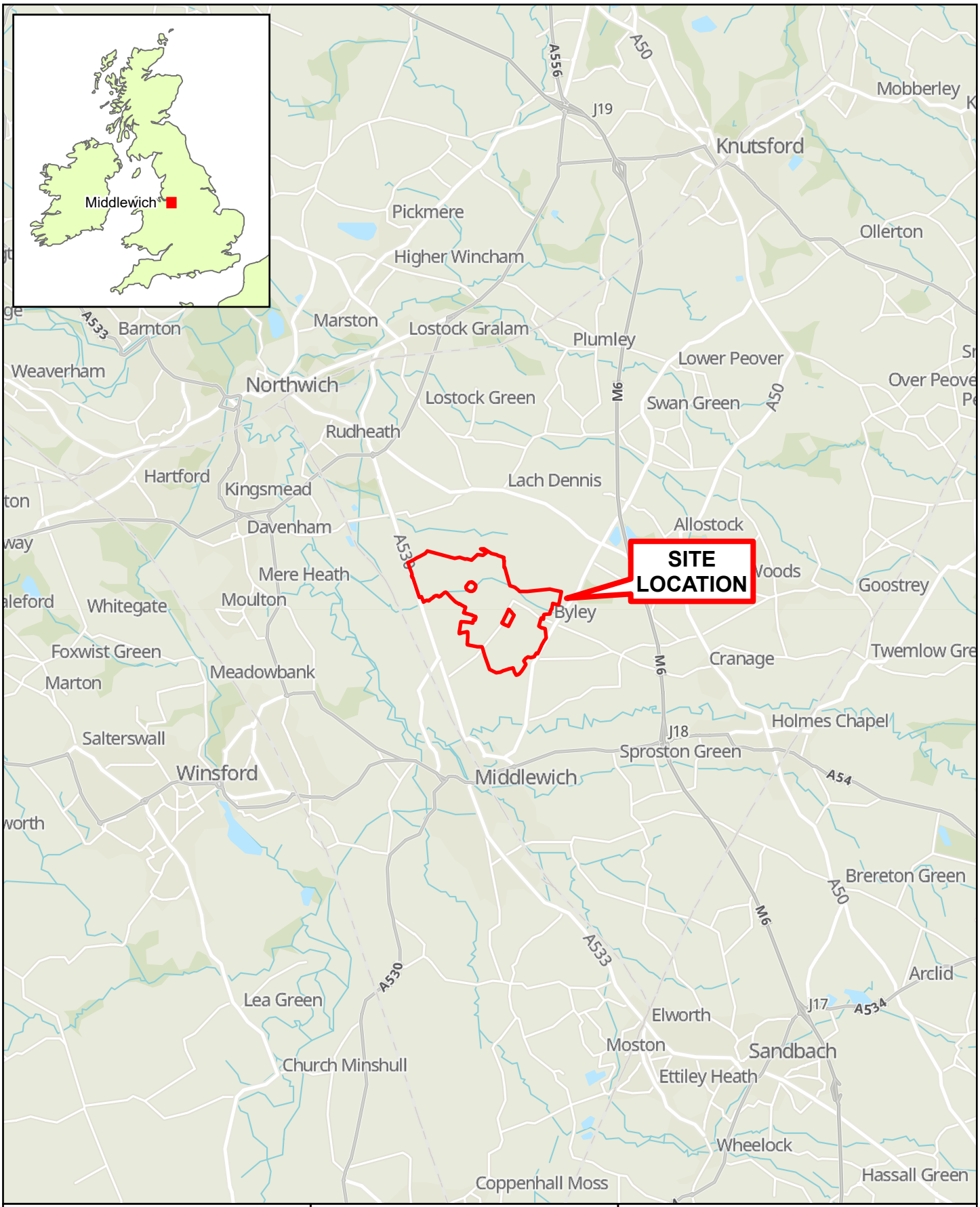
1.4.1.4 As per the Consented Development, there will be an installation of an additional pumping tank and a separate surge vessel, which will be undertaken within the existing Brine Purification Plant, at Lostock Works, off Griffiths Road, which is owned and operated by INOVYN Enterprises Limited.

1.4.1.5 Any brine generated during Construction that is not required for customer demand can be transferred to Runcorn for disposal via licenced outfall, using an existing pipeline between INOVYN's Lostock Works and Runcorn Site.

1.4.1.6 Whitley Pumping Station is an existing, but out of service, pumphouse approximately halfway between Lostock works and Runcorn Site. It was previously used to boost the pressure and flow in the pipeline that is now dedicated for the excess raw brine that is sent for discharge at Runcorn. A re-commissioning of this pumphouse was proposed for the Consented Development to allow improved operation.

1.4.1.7 Whilst information on the three satellite sites has been provided above for completeness, there will be no changes to any of these sites for the Proposed Development. The three satellite sites relate to work required solely for the solution mining of the caverns for either

natural gas or hydrogen, hence no changes to the infrastructure at these satellite sites are required for the change to hydrogen storage. Therefore, they will not be considered further within this PEIR.



Site Boundary

Figure 1.1
Site Location

SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: MC
PROJECT: 0755727	CHECKED: BH
DATE: 14/08/2025	APPROVED:

ERM

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PROJECTION: British National Grid

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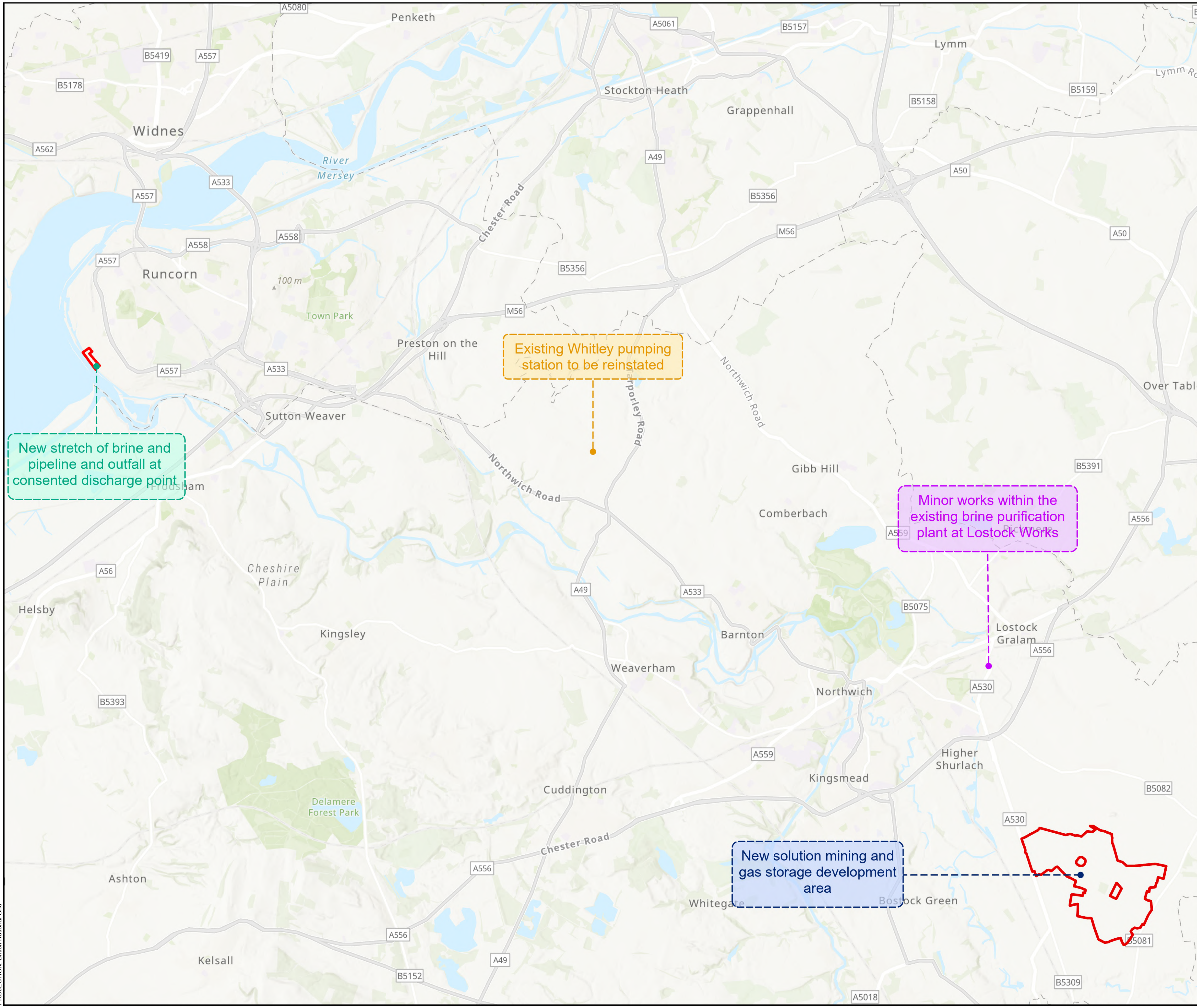

Existing Whitley pumping station to be reinstated
New stretch of brine and pipeline and outfall at consented discharge point
Minor works within the existing brine purification plant at Lostock Works
New solution mining and gas storage development area
Penketh
Widnes
Runcorn
River Mersey
Stockton Heath
Grappenhall
Lymm
Town Park
Preston on the Hill
Sutton Weaver
Over Tabl
Gibb Hill
Comberbach
Cheshire Plain
Helsby
Kingsley
Barnton
Lostock Gralam
Weaverham
Northwich
Higher Shurlach
Kingsmead
Cuddington
Delamere Forest Park
Ashton
Whitegate
Bostock Green
Kelsall
Northwich Road
Chester Road
Tarporley Road
M56
A49
A533
A556
A559
A530

- Site Boundary
- Existing Whitley Pumping Station
- Existing Brine Purification Plant at Lostock Works
- New stretch of brine and pipeline and outfall at consented discharge point

0 1 2 3 4
Kilometres
N

SCALE: See Scale Bar	VERSION: A01
SIZE: A3	DRAWN: MC
PROJECT: 0755727	CHECKED: DR
DATE: 26/09/2025	APPROVED: DR

Figure 1.2
Consented Development Boundary Material Change Amendment to the Keuper Gas Storage Project

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PROJECTION: British National Grid

Path: \\UKSPRDGISFS01\Data\London\Projects\0755727 - Keuper Hydrogen\Map\0755727 - Keuper Hydrogen - Scoping Figures.aprx\0755727 - Keuper Hydrogen - SCO - Consented Development Boundary - A01

1.5 OVERVIEW AND NEED FOR THE PROPOSED DEVELOPMENT

1.5.1.1 The UK Government's Hydrogen Strategy stated that the country's hydrogen production ambition will double to up to 10 GW by 2030[2]. Hydrogen, therefore, is expected to have an important role in the UK's energy transition towards net zero emissions. Whilst the increase in hydrogen production facilities will support this transition towards net zero, also having a sufficient energy storage system is critical to the foundation of a clean and secure energy supply. As a result, building the required storage infrastructure for hydrogen is key.

1.5.1.2 The Consented Development proposed to build an underground natural gas storage facility consisting of 19 salt caverns and associated gas treatment, and transfer facilities for connection to the national gas transmission network. With salt caverns being the best method for hydrogen storage, and in recognition of its increasing need, KGSL have been working towards an amendment to the Consented Development to allow for large-scale UHS. The Proposed Development will additionally form a critical element of the HyNet consortium for hydrogen generation and supply in the North West and Wales.

1.5.1.3 HyNet is the UK's leading industrial decarbonisation project, and will reduce the amount of carbon dioxide emitted from across the North West by a quarter. The North West is an ideal location for HyNet because of the region's concentration of energy intensive industries, existing technical skills base, and geological characteristics.

1.5.1.4 Further information on the need for the Proposed Development is provided in Section 5.3 of Chapter 5, Planning and Policy Context.

1.6 LINKED DEVELOPMENT

1.6.1.1 In order to operate, the Proposed Development will require a connection to a new proposed hydrogen pipeline. The NTS compound for natural gas will be replaced by a connection to the HAGI for the HyNet hydrogen transmission system (secured through Cadent's HyNet Hydrogen Pipeline DCO Application).

1.6.1.2 Potential cumulative effects of the HAGI and proposed hydrogen pipeline are considered within Chapter 18, Cumulative Effects Assessment.

1.7 ENVIRONMENTAL IMPACT ASSESSMENT

1.7.1.1 The Proposed Development is considered to fall within Schedule 2 of the Infrastructure Planning (EIA) Regulations 2017 (the EIA Regulations), specifically para 3(d) "*underground storage of combustible gases*".

[2] The British Energy Security Strategy published on 7th April 2022.

1.7.1.2 An EIA is required for development listed in Schedule 2 of the EIA Regulations if it is likely to have significant effects on the environment, by virtue of factors such as its nature, scale, and location. The applicable thresholds for this type of development are:

i) The area of any new building, deposit or structure exceeds 500 square metres

1.7.1.3 It is expected that the Proposed Development will occupy an area in excess of 500 square metres. Accordingly, an EIA is being undertaken pursuant to the EIA Regulations, which set out the requirements for undertaking an EIA and the required information for inclusion in an ES. The MC application will, therefore, be accompanied by an updated ES for the Proposed Development, prepared in accordance with the EIA Regulations.

1.7.1.4 To initiate the EIA process, the Applicant submitted an EIA Scoping Report ('the Scoping Report') to the Planning Inspectorate on 22 April 2025. The Scoping Report presented an initial consideration of the potential likely significant effects associated with the changes to construction, operation, maintenance, and eventual decommissioning of the Proposed Development. The purpose of the Scoping Report was to request a formal Scoping Opinion from the Planning Inspectorate and Secretary of State in accordance with Regulation 10 of the EIA Regulations. The Scoping Opinion was received on 5 June 2025. The Scoping Report and Scoping Opinion are available on the Planning Inspectorate National Infrastructure Planning Portal[3] and **Appendix 1A** and **Appendix 1B** respectively.

1.7.1.5 This PEIR addresses all matters raised in the Scoping Opinion to the extent practicable at this stage in the EIA process. The topic assessments **(Chapters 6 to 17)** include tabulated response to matters raised by consultees in the Scoping Opinion, during public consultation exercises, and for technical engagement with statutory consultees that has been undertaken since the Scoping Opinion was received. Where appropriate, the tables also set out where in the PEIR these matters have been addressed. For further details regarding consultation, please refer to **Chapter 4, EIA Methodology and Consultation**.

1.8 PRELIMINARY ENVIRONMENTAL INFORMATION

1.8.1.1 Pursuant to Regulation 8(2)(b) of the 2017 EIA Regulations, this MC application is accompanied by a PEIR. This PEIR includes information set out in Regulation 14(a) – (e) and any additional information specified in Schedule 4 of the 2017 EIA Regulations relevant to the specific characteristics of the Proposed Development; and to the environmental features likely to be significantly affected.

1.8.1.2 This PEIR comprises:

[3] UK Government (2025). National Infrastructure Planning – Planning Inspectorate. Available online at: https://infrastructure.planninginspectorate.gov.uk/

- a description of the Proposed Development;
- the environmental information collected to date, together with a preliminary assessment of the likely significant environmental effects of the Proposed Development;
- the mitigation measures identified to avoid, prevent or reduce adverse effects; and
- reasonable alternative sites, layouts and construction methodologies considered to date and the reasoning for selecting the preferred option, in consideration of the potential effects of the Proposed Development upon the environment.

1.9 COMPETENCE

1.9.1.1 The preparation of this PEIR is being led by ERM, who will provide local technical knowledge and resources across the environmental studies associated with the Proposed Development. Pursuant to Regulation 14(4) of the 2017 EIA Regulations, the PEIR and ES will be prepared by competent experts, and the PEIR and ES will outline the relevant expertise or qualifications of the experts. The PEIR and ES will also contain inputs from other technical consultancies where required: Peak Ecology Limited, Font Communications Limited, Land Use Consultants Limited and Nathaniel Lichfield and Partners Limited (Lichfields).

1.10 REPORT CONTENT AND STRUCTURE

1.10.1.1 The remainder of this PEIR includes the following:

- **Chapter 2, Proposed Development Description** – an overview of the Proposed Development;
- **Chapter 3, Alternatives** – outlines the options considered for the Proposed Development;
- **Chapter 4, EIA Methodology and Consultation** – describes the overall approach to the EIA;
- **Chapter 5, Planning and Policy Context** – an outline of relevant policy, standards, and guidance;
- **Chapter 6, Geology and Ground Conditions**
- **Chapter 7, Hydrology and Flood Risk**
- **Chapter 8, Air Quality**
- **Chapter 9, Noise and Vibration**

  Chapter 10, Ecology and Nature Conservation
- **Chapter 11, Landscape and Visual Impact Assessment**
- **Chapter 12, Cultural Heritage**

- **Chapter 13, Socio-economic Characteristics**
- **Chapter 14, Population and Human Health**
- **Chapter 15, Major Accidents and Disasters**
- **Chapter 16, Waste**
- **Chapter 17, Climate Change and Greenhouse Gas Emissions**
- **Chapter 18, Cumulative Effects**
- **Chapter 19, Securing Mitigation**– which sets out the approach to mitigation and commitments set out in the Consented Development.

REFERENCES

UK Government (2022). British Energy Security Strategy. Available online at: https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

UK Government (2025). National Infrastructure Planning – Planning Inspectorate. Available online at: https://infrastructure.planninginspectorate.gov.uk/

The British Energy Security Strategy published on 7th April 2022.

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