Keuper Gas Storage Project

Non - Material Change Application

APPLICATION STATEMENT

November 2022

Application Reference No:
EN030002

KEUPER GAS STORAGE PROJECT

The Keuper Underground Gas Storage Facility Order 2017

Statutory Instrument No. 2017/433

NON-MATERIAL CHANGE APPLICATION 2022

APPLICATION STATEMENT

Regulation No:	**Section 153 and Schedule 6 (Planning Act 2008)** **Regulation 4 (Infrastructure Planning Regs 2011)[1]**
Document Ref:	**11.01**
Author:	**Keuper Gas Storage Limited** **Bankes Lane Offices** **Bankes Lane** **Runcorn** **WA7 4JE**
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[1] S.I. 2011/2055 as amended by S.I. 2012/635, S.I. 2015/760 and S.I. 2020/1534. There are other amendments to the instrument which are not relevant to this Order

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1. Introduction and Description of the Application

1.1 Introduction

1.1.1 Keuper Gas Storage Limited (company number 08850140) of Bankes Lane Offices, Bankes Lane, PO Box 9, Runcorn, Cheshire, United Kingdom, WA7 4JE (known throughout this document as "**KGSL**" and the **applicant**) is submitting an application for a non-material change to the Keuper Underground Gas Storage Facility Order 2017 (S.I. No. 2017/433) (the "**DCO**"), made pursuant to Schedule 6 of the Planning Act 2008 and Part 1 of the Infrastructure Planning (Changes to, and Revocation of, Development Consent Orders) Regulations 2011 (S.I. No. 2055). The proposed changes are to the nature of gas stored and the siting and layout of one building and one compound within the Keuper Gas Storage Project (the "**Project**") permanent development site, referred to henceforth as the "**Site**".

1.1.2 The DCO authorises the development of a new underground gas storage facility in Cheshire and associated development. The DCO has been subject to the following correction since it was made on 15th March 2017:

- The Keuper Underground Gas Storage Facility (Correction) Order 2017 (SI 2017/820)

1.1.3 The 2017 Correction order corrected issues identified in the DCO (as originally granted) following requests made under paragraph 1(6)(a) of Schedule 4 to the Planning Act 2008. The corrections have no relevance to the amendments proposed here.

1.1.4 The need for gas storage to support the UK's energy supply infrastructure has not lessened since the granting of the DCO. In fact, recent concerns raised for energy security[2] have highlighted an increased need for such storage. Alongside this increased need for natural gas storage there is also an evolving need for hydrogen gas storage in the UK. This hydrogen gas storage will be vital in order for the UK Government to meet its legal commitments to reduce greenhouse gas emissions to net zero by 2050[3]. The UK Government policy paper British Energy Security Strategy published on 7th April 2022 recognises the importance that hydrogen gas and hydrogen gas storage can play in the storage of excess renewable electricity. Most natural gas operators in the energy supply industry already have hydrogen gas development programmes underway, with a number of active customer supply demonstration projects. The inclusion of hydrogen gas storage within the scope of this Project will enable growth in the low carbon energy sector and support projects, such as HyNet North West[4]. HyNet has been given Track 1 status by the UK Government's cluster sequencing process associated with the CCS Infrastructure Fund and the industrial cluster

[2] British Energy Security Strategy - https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

[3] Climate Change Act 2008 (as amended)

[4] https://hynet.co.uk/

decarbonisation programme. HyNet and INOVYN hydrogen storage were specifically mentioned in The Growth Plan 2022[5] as projects to be supported and accelerated.

1.1.5 It is the view of the applicant that the inclusion of hydrogen gas storage within the consented DCO is a matter of revising the definition of what constitutes a 'gas' under the DCO. The Gas Act 1986[6] already considers hydrogen gas exactly the same as it considers natural gas (methane), ethane and other flammable gases. The process of altering the wording of the DCO necessitates some other minor changes. These additional changes are set out in Section 2.2 (Extent of Changes).

1.1.6 The inclusion of hydrogen gas storage on site necessitates the inclusion of an option for an alternative gas connection compound (Work No. 12). This would be located further away from the national transmission system (natural gas) pipeline than currently proposed.

1.1.7 In addition to the proposals for the inclusion of hydrogen gas storage within the DCO the wider design of the Project has evolved since the granting of the original DCO. This design evolution has allowed the applicant to identify a preferrable option for the proposed siting and layout of one building (the Office, Control and Maintenance Building – Work No. 15) within the Site than its currently consented location.

1.1.8 The inclusion of a second option for the location of the gas connection compound and the relocation of the Office, Control and Maintenance Building will therefore require a number of minor changes (updates) to the Certified Plans[7].

1.1.9 As set out in Sections 2.4 and 2.5, the changes that are the subject of this application (considered both individually and at cumulative level) are considered to be minor in nature and would not result in a change to the magnitude or significance of effects identified within the Environmental Statement ("**ES**")[8] which was prepared to support the DCO.

1.1.10 No new significant environmental effects are predicted to arise as a result of the changes proposed that exceed or materially alter the effects assessed as part of the original ES as submitted for the DCO.

1.1.11 Whilst construction of the overall Project has commenced, the proposed gas connection compound and Office, Control and Maintenance Building have not yet been the subject of construction works. Therefore, the applicant wishes to state for clarity that the portions of the Project subject to the proposed changes have not yet commenced development.

1.1.12 In addition to the proposed changes the applicant also wishes to take advantage of this non material change (NMC) to update the registered address of KGSL.

[5] https://www.gov.uk/government/publications/the-growth-plan-2022-documents
[6] The Gas Act 1986 c44. (as amended). Section 48 Interpretation (definition of "gas")
[7] Plans and documents certified by the Secretary of State in accordance with Article 35 of the DCO
[8] KGSP Environmental Statement Document Ref 6.1 [online] (Dated Nov 2015)

1.2 Scope

1.2.1 Accordingly, consent is sought for:

- Amendment to the definition of "gas" as set out within Part 1 (PRELIMINARY), Article 2 (Interpretation) of the DCO to specifically include "hydrogen" gas as well as the current definition of "natural" gas;
- Amendment to the definition of Work No 12 within Schedule 1 (Authorised Development) to the DCO to remove the reference to "National Grid's national gas transmission system". This gives greater flexibility to the applicant to utilise both the national gas transmission system *and* any future hydrogen gas network system that should be developed;
- Amend wording from "national transmission system compound" to "transmission system compound" in:
    - The description of Work No.5D, Work No.7 and Work No.13 within Schedule 1 to the DCO; and
    - The title of Table 11 within Requirement 2, and the description within Requirement 4(1)(a)(iii) of Schedule 2 (Requirements) to the DCO;
- Removal of the limitation on "natural gas" only within Requirement 22 of Schedule 2 to the DCO;
- Amendment to the list of Certified Plans in Article 35 (Certification of Plans etc.) within Part 6 of the DCO to include the following list of updated plans:
    - 35(1)(e) Works plans 13-03-01/HOL/24/504-B2 and 13-03-01/HOL/24/510-B3;
    - 35(1)(i)(ii) Elevation drawings 13-03-01/HOL/24/274-B2 and 13-03-01/HOL/24/270-B5; and
    - 35(1)(m) Landscape plans 13-03-01/HOL/24/263-B2, 13-03-01/HOL/24/264-B2 and 13-03-01/HOL/24/266-B2;
- Amendment to the list of Certified Plans in Article 35 to include the following list of updated documents:
    - 35(1)(j) the seismic survey report Revision A (document ref: 9.1);
    - 35(1)(k) the sub-surface safety assessment report Revision B (document ref: 9.2); and
    - 35(1)(l) the preliminary study of gas design capacity Revision B (document ref: 9.3);
- Amendment to the registered address of the "undertaker" as defined within Part 1 (PRELIMINARY), Article 2 (Interpretation) of the DCO.

1.2.2 The only two proposed physical changes to the layout, as shown on the revised plans listed above, are:

- The option to include an alternative location of the proposed gas connection compound, Work No. 12; and
- The relocation of the proposed Office Building, Work No. 15.

1.3 The Site

1.3.1 The majority of the proposed development of the Project will be located at the Holford Brinefield site, in Cheshire, about 3km west of the M6 and approximately 3 km north of Junction 18. This main development area 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.

1.3.2 A full description of the site is given in the ES and other documents that accompanied the original DCO application. Within the ES it is referred to as the Main Assessment Area.

1.3.3 The Project also includes a number of other minor component parts, in addition to the main development area, that all relate to the solution mining infrastructure and are completely unaffected by any change from natural gas to hydrogen gas.

1.3.4 These remote component parts and locations are given below:

- Two brine pumping tanks at Lostock Works, Lostock Gralam;
- Refurbishment of a brine pumping station at Whitley;
- Installation of a new pipebridge and brine outfall at Runcorn Site, Runcorn.

1.3.5 Again, these areas and proposed works are described in detail in the ES and other documents associated with the DCO.

1.3.6 As these areas are only concerned with the solution mining activities within the Project to create the caverns and are not subject to any change they have not been included in the pre-application consultation. However, stakeholders in these areas will be included in the consultation required under Regulations 6 and 7 of the Infrastructure Planning (Changes to, and Revocation of, Development Consent Orders) Regulations 2011. Details of which are given in Section 4.

1.3.7 The majority of the land associated with the main project area, including the areas where the majority of the infrastructure is to be built is owned by INOVYN Enterprises Limited, sister company to KGSL. Both the applicant and this land owner are subsidiaries of INOVYN Limited.

1.3.8 The applicant has a leasehold interest from its sister company for the areas of the Holford Brinefield required to develop the Project. The nature of gas stored is not restricted by or relevant to that lease.

1.3.9 The lease area / INOVYN owned land will accommodate:

- The gas processing plant, the gas connection compound (which is the subject of this NMC), the two gas marshalling compounds and the office building (also the subject of this NMC);
- The main site entrance, minor road entrances and the majority of the site road network;
- The solution mining compound and the majority of the site pipeline network;
- Ten of the proposed cavern sites; and
- The majority of all other infrastructure.

1.3.10 Nine of the proposed cavern sites could not be accommodated on the INOVYN owned land thus extend on to neighbouring 3rd party owned farm land. All of the details of these were included in the approved DCO Land Plans and Book of Reference.

1.3.11 The DCO included powers of compulsory acquisition, although it has remained the intent of KGSL to reach commercial agreement with each of the 3rd party landowners.

1.3.12 Since the grant of the DCO in 2017 KGSL has secured commercial land purchase option agreements with all of the four affected land owners covering a total of eight of the nine caverns on 3rd party land.

1.3.13 One cavern site has not yet reached satisfactory conclusion but is still in the process of negotiation. The same 3rd party land owner has signed an agreement for two of the three cavern sites on their land, including the provision for hydrogen gas storage. However, the third cavern site on their land is subject to a mortgage holding by a bank. At present this bank has not agreed to the option agreement.

1.3.14 Due to the approach of the deadline included within the DCO for the expiry of the powers of compulsory acquisition, KGSL has served notice to treat on the 3rd party land owner and bank in accordance with the DCO. Despite this the applicant is committed to working with the landowner and bank to reach a negotiated settlement. Once agreement is achieved the notice to treat will be withdrawn.

1.3.15 Two of the 3rd party landowner agreements, covering three cavern sites, that were signed shortly after the grant of the DCO have since been varied by mutual deed to include the option of hydrogen storage as well as natural gas storage.

1.3.16 Two of the 3rd party landowner agreements, covering five cavern sites, were completed with the option for hydrogen gas storage as well as natural gas storage. One of which includes the 3rd party landowner that has yet to complete on the final cavern site.

1.3.17 Clearly the change to hydrogen was not a negative factor for any of these landowners.

1.3.18 Unrelated to the nature of gas stored and the proposed relocation of the compound and office, the DCO included compulsory acquisition powers for an access roadway. This access roadway has subsequently been purchased by KGSL by mutual negotiated commercial agreement.

1.3.19 For completeness: The Lostock Works site; Whitely Pumphouse site; and main Runcorn Site, which are the subject of the remote brine infrastructure are all owned by INOVYN. The brine pipebridge at Runcorn extends over land owned by the Canal & River Trust for which INOVYN have an option agreement in place. The brine outfall at Runcorn extends into property owned by Peel Holdings for which INOVYN have an option agreement in place. None of these are affected by the change to hydrogen gas storage and none of these are subject to the granted powers of compulsory acquisition.

2. Proposed Changes

2.1 Reasons for Change

2.1.1 The principle factors necessitating the proposed changes relate to the growing commitment to low carbon hydrogen as a future fuel or energy vector to allow the UK to meet its Net Zero targets and obligations.

2.1.2 In June 2019[9], the UK became the first major economy to legally commit to reducing greenhouse gas emissions to net zero by 2050, compared with the previous target of at least 80% reduction from 1990 levels. This is intended to deliver on the UK's commitment to the Paris Agreement[10].

2.1.3 Following the enactment of the Climate Change Act 2008 successive governments have published a number of strategies, white papers and action plans to achieve Net Zero. Many of these documents identify the replacement of natural gas with hydrogen together with associated carbon capture and storage, as critical if the UK is to achieve the 2050 target.

2.1.4 The Government's Ten Point Plan for a Green Industrial Revolution[11] published in November 2020 aims to make the UK a global leader in green technologies. It identifies technologies which brought forward together will deliver significant numbers of new jobs and support the UK to ultimately address its climate change commitments by 2050. Point 2 of the plan is to 'drive the growth of low carbon hydrogen' and Government has set an aim of delivering 5GW of low carbon hydrogen production capacity by 2030, attainment of which would be supported by the Net Zero Hydrogen Fund.

2.1.5 The Energy White Paper, 'Powering our Net Zero Future'[12], December 2020 recognises that setting a Net Zero target as a means of reducing the effects of future climate change requires investment and innovation and refers to the Ten Point Plan and the National Infrastructure Strategy as providing a strategy for the wider energy system. This includes the delivery of a greener energy system, which includes low carbon hydrogen.

2.1.6 The Industrial Decarbonisation Strategy[13] was published in March 2021 and sets out how industry can decarbonise in line with net zero, while remaining competitive and without pushing emissions abroad. Building on the Ten Point Plan, the Strategy sets out the Government's vision for a prosperous, low carbon UK industrial sector by 2050 and provides industry with the long-term certainty it needs to invest in decarbonisation. The Strategy recognises the need for

[9] The Climate Change Act 2008 (2050 Target Amendment) Order 2019

[10] UNCC International Treaty on Climate Change Dec 2015 - https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[11] https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution

[12] https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future

[13] https://www.gov.uk/government/publications/industrial-decarbonisation-strategy

funding mechanisms to support deployment and use of Carbon Capture Utilisation and Storage (CCUS) and low carbon hydrogen infrastructure.

2.1.7 The UK Hydrogen Strategy[14] was published in August 2021, alongside a consultation on a UK Low Carbon Hydrogen Standard. It establishes the case for low carbon hydrogen and the role of hydrogen in meeting net zero, recognising that it will play an important complementary and enabling role alongside clean electricity in decarbonising the UK's energy system. Furthermore, the Strategy states that hydrogen is suitable for use in a number of sectors where electrification is not feasible or is too costly, and other decarbonisation options are limited. Examples cited include the generation of high temperature heat in industrial furnaces, and long-distance and heavy-duty transport. The Strategy sets out options for an emissions standard that defines 'low carbon' hydrogen, including a methodology for calculating greenhouse gas emissions associated with hydrogen production and a subsequent greenhouse gas emissions threshold, against which different low carbon hydrogen production pathways would be measured. The Hydrogen Strategy also recognises the *"strategic value to a fully decarbonised energy system"* of hydrogen storage and the important role it can play to *"support security of supply"*. The Hydrogen Strategy goes on to discuss potential forms of hydrogen storage, stating that underground storage in salt caverns *"is able to provide large volume storage at lowest cost per unit of energy stored"* and that this *"is a significant strategic advantage for the UK compared to many other countries."* As construction of the Project has already commenced, it represents a vital opportunity to provide significant hydrogen storage to support energy security as rapidly as possible.

2.1.8 The Government's Net Zero Strategy: Build Back Greener[15] published in October 2021 builds upon the Ten Point Plan and provides policies and proposals to keep the UK on track to meet its carbon budgets and sets out a vision for a decarbonised economy in 2050. Under the heading of 'Fuel Supply and Hydrogen' it aims to support the creation of up to 10,000 jobs by 2030 in fuel supply, mobilise additional private and public investment of between £20 and £30 billion by 2037 and deliver 5GW of hydrogen production capacity by 2030 (with the expectation this could increase to 10 or 17GW by 2035 depending upon the role of hydrogen for heat). Key policies include the establishment of the Industrial Decarbonisation and Hydrogen Revenue Support (IDHRS) scheme to fund new hydrogen and carbon capture, part of which includes provision of £140m funding for electrolytic hydrogen production capacity and the Net Zero Hydrogen Fund, to provide £240m of Government co-investment for low-carbon hydrogen production. Under the heading of 'Industry' there is direct reference to HyNet, which along with the East Coast Cluster, is cited as acting as an economic hub for green jobs aligned with proposals to capture CO_2. Under the heading of 'heat and buildings' there is the policy of launching a hydrogen village

[14] https://www.gov.uk/government/publications/uk-hydrogen-strategy
[15] https://www.gov.uk/government/publications/net-zero-strategy

trial to inform a decision on the role of hydrogen in the domestic heating system.

2.1.9 The British Energy Security Strategy published on 7th April 2022 builds upon the Ten Point Plan and provides further policies and proposals to increase energy security, particularly noting the value of hydrogen for *"flexibility and as a storage solution"*. The Strategy proposes a doubling of the ambition for 2030 for low carbon hydrogen production to 10GW. In the Strategy the Government commits to provide business models to support hydrogen storage and transport infrastructure essential to grow the hydrogen economy.

2.1.10 The Growth Plan 2022 published on 23rd September 2022 lists *"infrastructure projects which will be accelerated as fast as possible*". The projects listed in the document *"may benefit from acceleration through planning reform, regulatory reform, improved processes or other options to speed up their development and construction, including through development consent processes"* (HM Government, 2022). Within the Energy and CCS sections of the Plan, INOVYN Hydrogen Storage is mentioned as one of these projects. This highlights the Government's recognition of the urgent need for particular infrastructure schemes (including the Project) to be accelerated, particularly in light of the current economic situation and climate emergency. The Project is a critical part of the wider HyNet Cluster, which is also recognised as a key infrastructure project within the Growth Plan. The Growth Plan clearly acknowledges the need to expedite the decision making process to enable key schemes like the Project to come forward sooner so the benefits can be realised as early as possible.

2.1.11 HyNet North West is the UK's leading industrial decarbonisation project that will unlock a low carbon future. HyNet aims to meet the major challenge of reducing carbon dioxide emissions, providing low carbon power for industry, transport and low carbon heating for homes and businesses. From the mid-2020s, HyNet will produce, store and distribute low carbon hydrogen as well as capture and lock up carbon dioxide emissions from industry. By 2030, HyNet aims to reduce carbon dioxide emissions by 10 million tonnes every year.

2.1.12 As with natural gas, all energy supply infrastructure systems require energy storage to provide resilience to the system and smooth the peaks and troughs between production and consumption. The HyNet project has identified a need for approximately 1.3TWh's of energy storage as hydrogen gas to balance the network. This level of storage can be adequately provided by the Keuper Gas Storage Project if so developed for hydrogen gas storage in the proposed 19 salt caverns. The only changes required to the Project to enable hydrogen gas storage in addition to natural gas are those set out in this Statement.

2.1.13 In summary, the UK has enacted legally binding commitments to reach Net Zero by 2050. From a review of the subsequent strategies, white papers and action plans produced by government it is clear that it considers that the substitution of natural gas with hydrogen gas represents a technically achievable, deliverable and cost effective way of delivering clean energy to major users of gas for heat and as a means of replacing natural gas in domestic supply.

2.1.14 Emerging government policy in the form of the consultation draft Overarching National Policy Statement for Energy EN-1[16] states in paragraph 3.4.16 that "*there is an urgent need for all types of low carbon hydrogen infrastructure to allow hydrogen to play its role in the transition to net zero*".

2.1.15 The new draft EN-1 states in paragraph 3.4.10 that "*natural gas infrastructure might also be repurposed in the future for use by other gases required to deliver a net zero economy, such as low carbon hydrogen or for transportation of carbon dioxide to storage. Therefore, there is an ongoing need for retaining and developing the infrastructure for importing, storing and transporting gas*".

2.1.16 However, the policy also recognises the continued need for natural gas storage infrastructure particularly due to the increased UK reliance on imported natural gas as existing North Sea reserves are exhausted. Therefore, it is important for the Project to retain the option for natural gas storage in addition to the potential for hydrogen gas storage.

2.1.17 The Planning Act 2008 defines underground gas storage facilities above a threshold (met here) as 'Nationally Significant Infrastructure Projects' (NSIPs). Whilst the definition of gas includes natural gas (*in Article 235 – Interpretation*) *it specifically does not exclude other gases, including hydrogen gas*. Thus, a large scale underground hydrogen gas storage facility would still be defined as an NSIP with development consent determined by the Secretary of State.

2.1.18 The consultation Draft National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)[17] is primarily focussed on natural gas infrastructure and natural gas storage but does state at paragraph 1.6.4 "*New hydrogen pipelines and underground storage for hydrogen (in both cases whether or not blended with natural gas) will require consent from the Secretary of State where they meet the threshold at paragraph 1.6.1(i) (but only so far as it related to storage), (iii) and (iv). The need for low carbon hydrogen infrastructure is established in Section 3.4 of EN-1. The guidance that follows in this NPS has been drafted in respect of, and has effect only in relation to, natural gas infrastructure*".

2.1.19 The principle factor necessitating the proposed change to the location of the Office, Control and Maintenance Building (Work No. 15) is risk management. Safety incidents on gas processing facilities of this type are extremely rare. However, the COMAH[18] legislation requires operators to consider all possible eventualities, consequences and possible mitigation measures for these types of facilities and possible incidents that could occur.

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16 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1015233/en-1-draft-for-consultation.pdf

17 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1015237/en-4-draft-for-consultation.pdf

18 COMAH – The Control of Major Accident Hazards Regulations 2015.

2.1.20 The risk to operators and personnel on site can be reduced by simply moving them further away from the main plant equipment during times when they are located at a control system panel, desk or during break times.

2.2 Extent of Changes

2.2.1 It is believed that in the context of the consented DCO the inclusion of hydrogen gas storage in addition to natural gas storage can be deemed minor in nature. The proposed storage facilities for either gas are similar and comprise of salt caverns, pipelines and processing plant. Similar hydrogen gas facilities have been operating in Teesside in north-east England for several decades, thereby demonstrating this is a successful and safe technology.

2.2.2 The option to include hydrogen gas storage in addition to natural gas storage does **not** require any change to:

- the number, location, size and type of salt caverns and wellhead compounds proposed;
- the number, location, size and type of pipelines proposed with the exception of the gas connection pipeline, which would be shorter;
- the site road network of 7.8km with the exception of the immediate gas connection compound spur of 70m for the original natural gas compound and 35m for the hydrogen gas connection compound;
- any ancillary development including the brine and water infrastructure for solution mining;
- the layout of any of the Project components except those listed in Section 1.2 Scope (gas connection compound Work No. 12);
- the layout and principle components of the gas processing plant; and
- the electrical supply infrastructure.

2.2.3 The development options for both natural gas storage and hydrogen gas storage present an essentially 'equal impact'.

2.2.4 The only notable differences between the natural gas option and the hydrogen gas option relate to:

- The nature of the gas stored;
- The materials of construction (i.e. – grades of steel) of certain components such as gas wellheads; and
- Some internal gas process plant equipment items which are not specified within the DCO.

2.2.5 This application and option to include hydrogen gas storage does not require or seek to make changes to the Requirements of Schedule 2 to the DCO with regards to sizes of components, emissions or limits.

2.2.6 For specific hydrogen gas storage to support the HyNet North West project it will be necessary to connect directly to Cadent Gas Limited's proposed hydrogen gas network. This option necessitates a gas connection compound in a different location not directly on top of the natural gas pipeline owned by National Grid Gas, known as the National Transmission System (NTS). The proposed Cadent

hydrogen gas network is the subject of a separate DCO application[19], not connected to the Project.

2.2.7 Should the Project be developed for natural gas storage *or* should the NTS be wholly or locally converted to hydrogen gas distribution, then the previously proposed location (option) for the gas connection compound would require to be used and thus this option needs to be retained.

2.2.8 The proposed changes are explained in detail in Section 2.4 - Detailed Description of the Proposed Changes to the Consent. A comparison of the previously approved site layout shown in Landscape Plans 13-03-01/HOL/24/266-B1, 267-B1 and 268-B1 and the proposed revised site layout shown in Landscape Plan 13-03-01/HOL/24/266-B2 demonstrates that the differences are imperceptible when viewed from outside the main Site boundaries. No changes are proposed to the scale, location or design of the main gas processing plant and the buildings within that site. In addition, no material changes are proposed to the overall Site footprint or to the landscaping or boundary treatment of the Site. The proposed changes would principally affect an office building and compound which have been subject to some limited repositioning.

2.2.9 Section 2.4 explains the reasons for each of the proposed changes on an item-by item basis.

[19] https://infrastructure.planninginspectorate.gov.uk/projects/north-west/hynet-north-west-hydrogen-pipeline/?ipcsection=docs

2.3 Materiality

2.3.1 Schedule 6 of the Planning Act 2008 makes provision for the Secretary of State ("**SoS**") to grant both material and non-material changes to a development consent order.

2.3.2 There is no statutory definition of "materiality" for the purposes of the Planning Act 2008. The Government's December 2015 "Planning Act 2008: Guidance on Changes to Development Consent Orders" ("DCLG Guidance") is clear that decisions on whether particular types of change would be material or non-material will inevitably depend on the circumstances of the specific case. However, the DCLG Guidance sets out four examples of characteristics which indicate that a change is more likely to be treated as a material change. Each of these characteristics is considered in Table 2.1 in the context of KGSL's proposed changes.

Table 2.1 – Assessment of Proposed Changes against 'Materiality' Characteristics

Materiality Considerations	Assessment
A change should be treated as material if it would require an updated Environmental Statement (from that at the time the original DCO was made) to take account of new, or materially different, likely significant effects on the environment.	The proposed changes that are the subject of this application do not require an updated ES because the changes would not result in any new or materially different likely significant effects on the environment, as set out in the Keuper Hydrogen Storage Non-material Change Application – Environmental Report
A change is likely to be material if it would invoke a need for a Habitats Regulations Assessment. Similarly, the need for a new or additional licence in respect of European Protected Species is also likely to be indicative of a material change.	The proposed changes that are the subject of this application do not invoke a need for an updated Habitats Regulations Assessment (HRA), nor a need for any new or amended European Protected Species licence.
A change should be treated as material that would authorise the compulsory acquisition of any land, or an interest in or rights over land that was not authorised through the existing DCO.	This application does not seek authorisation to compulsorily acquire any land, or an interest in or rights over land, that was not authorised through the existing DCO. The majority of the proposed development consented by the DCO is to be built upon land owned by INOVYN Enterprises Limited, sister company to KGSL. Both KGSL and INOVYN Enterprises Limited are subsidiaries of INOVYN. KGSL has been granted a lease by INOVYN Enterprises Limited for its land that is required for the Project. The proposed relocation of the Office, Control and Maintenance Building and the option to relocate the Gas Connection Compound are wholly within the INOVYN Enterprises Limited land leased to KGSL both before and after the change. The DCO included powers of compulsory acquisition and other rights in Part 5 Articles 20 to 31, associated with the location of nine caverns and the use of a private access roadway. Since the grant of the DCO in March 2017 KGSL has sought to reach

	amicable commercial arrangements with all those landowners subject to those acquisition rights. In the case of two properties, covering three caverns, agreement was reached with the owners in 2017 for a commercial option agreement. By mutual agreement, these land purchase agreements have been subsequently updated to include the hydrogen gas storage option. In the case of three properties, covering six caverns and the access roadway, despite continuing negotiations and good intentions, agreement was not reached before the approaching deadline of the end of the powers to serve Notice to Treat under Article 21 of the DCO. Thus, to protect the position of KGSL whilst negotiations / completion of agreements continued, Notice to Treat was served on the various parties associated with these three properties. Since that time most of these agreements have now been concluded meaning that the Notice to Treat process is no longer required and the notices will be withdrawn as soon as the registration of the land charges has been cleared through the Land Registry process. Details of these transactions are given in Section 1.3. Five of the six cavern sites referred to above and the access roadway, included within the Noticed to Treat process, have concluded successfully with only one cavern site still in negotiation. The time limit for the exercise of authority to acquire land compulsorily has now passed, but the authority is no longer required beyond the protective position described above. The changes proposed in this application have no impact on the required 'rights' as described in the Book of Reference and as shown on the Land Plans. In all cases, where appropriate, the commercial arrangements for securing the land necessary for the development of the gas storage caverns includes provision for hydrogen gas storage as well as natural gas storage.
The potential impact of the proposed changes on local people will also be a consideration in determining whether a change is material.	The DCLG Guidance states that the potential impact of proposed changes on local people will also be a consideration in determining whether a change is material. The DCLG Guidance explains that additional impacts that may be relevant to whether a particular change is material will depend on the circumstances of a particular case, but examples might include those relating to visual amenity from changes to the size or height of buildings; impacts on the natural or historic environment; and impacts arising from additional traffic. The proposed changes that are the subject of this application are not likely to result in any additional or materially different effects on local communities or business, as is demonstrated in the review of Socio-Economic effects as set out in the Keuper Hydrogen Storage Non-material Change Application – Environmental Report.

Conclusion

2.3.3 The applicant has assessed the proposed changes against the DCLG Guidance and is of the view that the proposed changes are non-material.

2.4 Detailed Description of the Proposed Changes to the Consent

2.4.1 Section 1.2 (Scope) sets out the amendments required to the wording of the DCO to support the option to include hydrogen gas storage.

2.4.2 The primary change is to the definition of 'gas' within Part 1 (PRELIMINARY), Article 2 (Interpretation) of the DCO. The applicant proposes the substitution of the existing definition that strictly relates to 'natural gas' with one that includes hydrogen gas within the parameters of its definition.

2.4.3 Prior to this request, the applicant has undertaken extensive design studies and project development activities which demonstrate that the change to the actual gas stored can be achieved without necessitating a change to the parameters of the Project as defined in Schedule 1 (Authorised Development) or Schedule 2 (Requirements) to the DCO, other than the location of the Gas Connection Compound.

2.4.4 Geostock, a specialist subsurface cavern engineering contractor and author of the original cavern design reports listed in the Certified Plans of Article 35 of the DCO has undertaken further design studies to demonstrate that the caverns are capable of accommodating hydrogen gas in place of natural gas without any safety or technical concerns.

2.4.5 For further technical details of the updated Geostock studies please refer to the following reports submitted as part of this application:

- The seismic survey report Revision A (document ref: 9.1);
- The sub-surface safety assessment report Revision B (document ref:9.2); and
- The preliminary study of gas design capacity Revision B (document ref: 9.3).

2.4.6 Due to the different density and behaviour with regard to the Joules-Thomson effect[20] of hydrogen gas compared with natural gas some capacity measurement quantities and operating parameters will be different. These differences have no impact on external effects of the Project or specified components of the authorised development as defined in Schedules 1 and 2 to the DCO.

2.4.7 Each of these reports has been revised, requiring an update to the defined list of Certified Plans in Article 35 of the DCO to refer to the most recent version at 35(1)(j), 35(1)(k) and 35(1)(l).

2.4.8 The seismic survey report (document ref: 9.1) has been updated with new information from more recent boreholes within the Holford Brinefield that have been drilled since the original application date of November 2015. This has resulted in very minor recalibration of the interpretation of the seismic lines and data used to determine the depth of salt. These changes are considered to be negligible. In any case, the seismic interpretation functions primarily as a predictive tool and the actual depth of salt will be determined during the future drilling operations for the Project. Relevant changes relating to the text and/or tables contained within the report are indicated. It should be noted that the

[20] The Joules-Thomson effect describes the increase or decrease in temperature of a 'real' gas when allowed to expand freely through a throttling device.

changes are not associated with the proposed introduction of hydrogen gas, they specifically and wholly relate to the updated field measurements. This non-material change application is just being used as a vehicle to register the change to this report.

2.4.9 The sub-surface safety assessment report (Document Ref: 9.2) has also been updated with new information related to natural gas since the original report published in November 2015 and has also been updated to include information relevant to the storage of hydrogen gas. The updates are highlighted separately between those that relate to natural gas and those that relate to hydrogen gas. It should be noted that the revisions to include hydrogen gas indicate that there are no known material differences between the interactions between the salt cavern storage facilities with natural gas *or* hydrogen gas.

2.4.10 The preliminary study of gas design capacity (document ref: 9.3) has been updated with new information related to natural gas since the original report from November 2015, namely as a result of the minor updates to the seismic interpretation as described above and information relevant to the storage of hydrogen gas. It should be noted that whilst the overall storage quantities differ between natural gas and hydrogen gas due to the different gas densities the cavern size and layout will not differ.

2.4.11 In addition to the NMC to the consented DCO a revised application has been made to the relevant Hazardous Substances Authority, in this case the Local Planning Authority (LPA), to confirm the inclusion of a hydrogen gas option within the Project represents no significant difference between the key parameters of the two gases with regards to Hazardous Substances Consent[21]. Following a review by the Health and Safety Executive they have raised no objection to the grant of Hazardous Substances Consent for hydrogen.

2.4.12 As detailed in Section 1.2 (Scope) the proposed change to the wording of the DCO to support the option for the storage of hydrogen gas is simply the addition of 'hydrogen' to the definition of 'gas' in the DCO definitions (Article 2 Interpretation).

2.4.13 As a consequence of this proposed change there must be an alteration to the wording of Requirement 22 of Schedule 2 to the DCO, which specifically states that '*natural gas'* must be conveyed by pipeline to and from the authorised development. The applicant suggests this wording is revised to 'natural gas *or* hydrogen gas'.

2.4.14 The proposed changes to the DCO to include hydrogen gas storage in addition to/in replacement of natural gas storage will necessitate the relocation of the gas connection compound (Work No.12). This is described in more detail in the next section (*Changes to Site Layout*). The applicant proposes renaming this compound and changing its description to allow for it to relate to natural gas *and/or* hydrogen gas. The proposed change relates to the description of the gas compound (Work No.12) in Schedule 1 (Authorised Development) to the DCO.

[21] The Planning (Hazardous Substances) Act 1990 and The Planning (Hazardous Substances) Regulations 2015

2.4.15 The applicant's proposed change to the description of Work No.12 relates to the removal of the reference to "National Grid's national gas transmission system" and substitution with "the gas transmission system pipeline network." The remainder of the description of the purpose/content of the compound remains unchanged. The proposed new title would allow for the utilisation of either natural gas and/or hydrogen gas.

2.4.16 Following the change to the wording of the description of Work No.12 there are some related minor changes to other component descriptions that refer to this compound. These are summarised in the bullet points below:

- Remove the word 'national' from the description of Work No.5D;
- Remove the word 'national' from the description of Work No.7;
- Remove the word 'national' from the description of Work No.13;
- Remove the word 'national' from the title of Table 11 within Requirement 2, Schedule 2 to the DCO; and
- Remove the word 'national' from the description in Requirement 4(1)(a)(iii), Schedule 2 to the DCO.

2.4.17 In each of the above cases the reference still includes "Work No.12".

2.4.18 The option to relocate the gas connection compound and the proposed relocation of the Office, Control and Maintenance Building will require updates to the site layout as set out in the next section. These layout changes will require updates to a number of the certified plans as listed in Article 35 of the DCO.

2.4.19 No additional plans are proposed to be added or removed from the certified plans list. However, seven listed plans shall be revised with marked changes.

2.4.20 The seven revised plans are:

- Work plan 13-03-01/HOL/24/504-B2 [replacing "-B1" in 35(1)(e)];
- Work plan 13-03-01/HOL/24/510-B3 [replacing "-B2" in 35(1)(e)];
- Elevation drawing 13-03-01/HOL/24/270-B5 [replacing "-B4" in 35(1)(i)(ii)];
- Elevation drawing 13-03-01/HOL/24/274-B2 [replacing "-B1" in 35(1)(i)(ii)];
- Landscape plan 13-03-01/HOL/24/263-B2 [replacing "-B1" in 35(1)(m)];
- Landscape plan 13-03-01/HOL/24/264-B2 [replacing "-B1" in 35(1)(m)]; and
- Landscape plan 13-03-01/HOL/24/266-B2 [replacing "-B1" in 35(1)(m)].

2.4.21 Finally, the 'undertaker' as defined in the DCO (Article 2 Interpretation) and referred to as KGSL in this document has moved its registered office to Bankes Lane Office, Bankes Lane, PO Box 9 Runcorn, Cheshire, WA7 4JE from that shown in the DCO (as "Runcorn Site HQ, South Parade"). In addition to the proposed changes the applicant also wishes to take advantage of this NMC to update the registered address of KGSL.

2.5 Detailed Description of the Proposed Changes to Site Layout

Gas Connection Compound

2.5.1 The gas connection compound is listed in Table 11 of Requirement 2 in Schedule 2 to the DCO as a compound enclosed by a security fence of 50m width x 60m length.

2.5.2 The compound is shown in outline only within the Works Plans, primarily within Work Plan 13-03-01/HOL/24/510 which shows the above ground works. It is also illustrated in Work Plan 13-03-01/HOL/24/504 which shows the below ground works but only as the destination of the buried gas connection pipeline Work No. 13 and the buried communication system cable Work No. 5D.

2.5.3 The gas connection compound is also shown in three of the Landscape Plans (numbers 13-03-01/HOL/24/263, 264 and 266) which show various stages of the development and the associated landscape planting that will be used to provide screening to the development and habitat enhancement.

2.5.4 The compound is the subject of one Elevation Drawing 13-03-01/HOL/24/274. The sole change to this drawing relates to the inset 'location plan'.

Works Plans

2.5.5 The Works Plans illustrate the main infrastructure components of the authorised development in outline, together with the limits of deviation for said components. Within the limits of deviation as shown by the plans the undertaker KGSL can deviate laterally in constructing the development.

2.5.6 The limits of deviation shown for the gas connection compound Work No. 12 are reasonably extensive. They also merge into the limits of deviation for the gas processing plant Work No. 14 and various construction laydown areas Work No. 16. There is no distinct separation between these areas.

2.5.7 However, for the avoidance of doubt, it is proposed to modify the labelling of the existing limits of deviation (without actually changing the limits / areas concerned) and show the outline of the gas connection compound in the two possible preferred locations. These changes are shown on plan 13-03-01/HOL/24/510-B3.

2.5.8 From an environmental impact point of view, the second location (for connection to the hydrogen network) was already designated and assessed for its impacts as a construction laydown area Work No. 16 and would have been the subject of the expectation for soil clearance and excavation. Thus, the environmental impacts of the change are considered to be negligible. Construction laydown will be managed within the other designated areas and no additional laydown areas will be used other than those previously specified.

2.5.9 The Works Plans for the subsurface infrastructure show the gas connection pipeline Work No. 13 and the buried communication system cable Work No. 5D between the gas processing plant Work No. 14 and the gas connection compound Work No. 12. The route of both these buried services already passes

through the new alternative location for the hydrogen gas connection compound. Thus, there are no updated drawings required for the infrastructure shown. However, for clarity the alternative hydrogen gas connection compound has been shown on the updated drawing 13-03-01/HOL/24/504-B2.

Landscape Plans

2.5.10 The Landscape Plans show the proposed landscape measures that will be undertaken during the development of the Project. Requirement 6 of Schedule 2 to the DCO requires KGSL to seek approval from the LPA for a detailed landscaping scheme for each part of the development. Whilst the landscaping scheme submitted under Requirement 6 must accord with the Landscaping Plans it can be tailored to take into consideration the micro-siting of all infrastructure and in particular the constructed location of the gas connection compound Work No. 12.

2.5.11 Landscape Plan 13-03-01/HOL/24/263 shows the first stage of construction, namely road building and construction laydown areas. The drawing also shows indicative locations for temporary soil storage mounds. The proposed alternative location for the hydrogen gas connection compound overlaps one of these construction laydown areas and temporary soil storage mounds. Thus, the impact on the built environment is deemed to be no different to that already assessed. The drawing has been updated (to revision -B2) to show both possible locations of the gas connection compound.

2.5.12 Landscape Plan 13-03-01/HOL/24/264 shows the second stage of construction, namely, the construction of the gas processing plant Work No. 14 and the gas connection compound Work No. 12. Similar to the above, indicative soil storage mounds are shown. The drawing has been updated (to revision -B2) to show both possible locations for the gas connection compound.

2.5.13 Landscape Plan 13-03-01/HOL/24/266 shows the 'final' landscaping detail for this part of the development infrastructure. It should be considered to be more definitive than the previous two drawings and represents the minimum level of landscape planting as the base case for the Landscaping Scheme submitted under Requirement 6 of Schedule 2 to the DCO. The drawing has been updated (to revision -B2) to show both possible locations for the gas connection compound and the minimum level of landscaping that would be employed at either location.

2.5.14 Some of the proposed landscape planting work has already been partially completed at the time of writing (autumn 2022,) consistent with the first phase of construction of the road infrastructure but targeted to provide early screening of the future hydrogen gas connection compound and office, control and maintenance building.

Elevation Drawings

2.5.15 Elevation Drawing 13-03-01/HOL/24/274 shows the elevation view of the gas connection compound from various directions.

2.5.16 There are no proposed changes to these elevations and the compound detail itself. However, the drawing includes an inset 'Location Plan' showing the proposed location of the compound. The inset location plan and drawing title have been updated and the drawing revision updated to "-B2", to reflect the hydrogen gas storage option.

2.5.17 The gas connection compound is only <8% of the area of its neighbouring infrastructure compound, the gas processing plant, Work No.14. On that basis it comprises a very small proportion of the overall project area within the Order Limits of the DCO.

2.5.18 The two (optional) proposed locations for the gas connection compound are approximately 250m apart. The new location for the (hydrogen) gas connection compound is further into the site, further from the public highway and further from neighbouring properties.

Office, Control and Maintenance Building

2.5.19 The Office, Control and Maintenance Building (Work No. 15) is listed in Table 1 of Requirement 2 in Schedule 2 to the DCO as one component of the gas processing plant (Work No. 14) with dimensions 30m width by 40m length by 5m high.

2.5.20 The building is shown in outline only in the Works Plans, principally in Work Plan 13-03-01/HOL/24/510 which shows the above ground works. It is also shown in Work Plan 13-03-01/HOL/24/504 below ground works but only as the destination of the buried towns water supply pipeline (Work No. 17) and the buried sewer pipeline (Work No. 18) to the building.

2.5.21 The building is shown in three of the Landscape Plans 13-03-01/HOL/24/263, 264 and 266 which shows various stages of the development and the associated landscape planting that will be used to provide screening to the development and habitat enhancement.

2.5.22 The building is one component shown in the gas plant Elevation Drawing 13-03-01/HOL/24/270. The main change to this drawing relates to the inset 'Location plan' used to orientate the drawing as the building is proposed to be moved.

Works Plans

2.5.23 The Works Plans show the main infrastructure components of the authorised development in outline, together with the limits of deviation for those components.

2.5.24 The limits of deviation shown for the office building (Work No. 15) are reasonably extensive. They also merge into the limits of deviation for the gas

processing plant (Work No. 14) and various construction laydown areas (Work No. 16). There is no distinct separation between these areas.

2.5.25 As explained previously, it is intended to relocate the office building from its current close proximity to the gas processing plant to a greater distance for safety reasons. The proposed new location had previously been identified and assessed from an environmental impact perspective as a construction car park / construction laydown area.

2.5.26 The new location is shown on plan 13-03-01/HOL/24/510-B3 with the previous location removed as a 'tracked change'. For the avoidance of doubt the labelling of the limits of deviation are modified (without actually changing the limits / areas concerned).

2.5.27 From an environmental impact point of view, the new location was already designated and assessed for its impacts as a construction laydown area (Work No. 16). Thus, the environmental impacts of the change are deemed to be negligible. Construction laydown and contractor car parking will be managed within the other designated areas and no additional laydown areas will be used other than those previously specified.

2.5.28 The Works Plans for the subsurface infrastructure show a buried water supply pipeline (Work No. 17) and a buried sewer pipeline (Work No. 18) from the public highway (King Street) to the office building. The route of both these buried services already passes close to the new location for the building and under the previously designated contractor car park access road. To accommodate the new location of the building it is necessary to update the routing of these pipelines. Whilst the new route is slightly outside of the limits of deviation of the previous route, it is considerably shorter and therefore of lower impact. Furthermore it is within the area designated for the contractor carpark / access road, thus was subject to the expectation of soil clearance and excavation work; and is of such a minor significance (narrow diameter pipelines) that the change is considered to be 'de minimis'. The proposed changes are shown on the updated drawing 13-03-01/HOL/24/504-B2.

<u>Landscape Plans</u>

2.5.29 The Landscape Plans show the proposed (minimum) landscape measures that will be undertaken during the development of the Project. Requirement 6 of Schedule 2 to the DCO requires KGSL to seek approval from the LPA for a detailed landscaping scheme for each part of the development.

2.5.30 Landscape Plan 13-03-01/HOL/24/263 shows the first stage of the construction and in particular road building and the construction laydown areas. The drawing has been updated (to revision -B2) to show the proposed new location of the office building.

2.5.31 Landscape Plan 13-03-01/HOL/24/264 shows the second stage of the construction and in particular the construction of the gas processing plant (Work No. 14). Similar to the above, indicative soil storage mounds are shown. The

drawing has been updated (to revision -B2) to show the proposed new location for the office building.

2.5.32 Landscape Plan 13-03-01/HOL/24/266 shows the 'final' landscaping detail for this part of the development infrastructure. It should be considered to be more definitive than the previous two drawings and represents the minimum level of landscape planting as the base case for the Landscaping Scheme submitted under Requirement 6 of Schedule 2 to the DCO. The drawing has been updated (to revision -B2) to show the proposed new office building and the minimum level of landscaping that would be employed.

2.5.33 Some of the proposed landscape planting work has already been partially completed at the time of writing (autumn 2022) consistent with the first phase of construction of the road infrastructure but targeted to provide early screening of the future hydrogen gas connection compound and office, control and maintenance building.

Elevation Drawings

2.5.34 Elevation Drawing 13-03-01/HOL/24/270 shows the elevation view of the gas processing plant from various directions. Included within these views are the office building as shown in the original location.

2.5.35 There are no proposed changes to the elevations of the components of the gas processing plant and the main compound detail itself. However, the drawing does show the profile of the office building from various views. These elevations have been updated to reflect the greater separation distance. In addition, the drawing includes an inset 'Location Plan' showing the proposed location of the compound. The inset location plan has been updated and the drawing revision updated to "-B5", to reflect the hydrogen gas storage option.

2.5.36 The office building is only 3% of the area of its neighbouring infrastructure compound, the gas processing plant, Work No.14. Therefore, proportionally, it constitutes a very small part of the overall project area within the Order Limits of the DCO.

2.5.37 The proposed new location for the office building is located approximately 200m further west than originally proposed.

Key Plans

2.5.38 The Works Plans subject to the alterations described in the previous sections were part of a set of Works Plans drawings submitted as part of the original DCO submission. As there were more than 3 drawings in the set a Key Plan 13-03-01/HOL/24/500-B1 was submitted with the DCO application and is listed in Article 35 Certified Plans. There are no changes required to this key plan and it still correctly identifies the members of the set of plans for works.

2.5.39 The Landscape Plans subject to the alterations described above were part of a set of Landscape Plan drawings. As there were more than 3 drawings in the set a Key Plan 13-03-01/HOL/24/240-B1 was submitted with the DCO application and is listed in Article 35 Certified Plans. There are no changes required to this key

plan and it still correctly identifies the members of the set of plans for landscaping.

2.5.40 The Elevation Drawings subject to the alterations described above were individual separate drawings and not part of a set of elevation drawings with a key plan.

3 Supporting Environmental Information

3.1 Environmental Impact Assessment

3.1.1 Consideration has been given to whether the proposed changes to the DCO give rise to any:

- new likely significant effects on the environment that were not identified in the ES for the consented project; and/or
- materially different likely significant effects (positive or negative) on the environment when compared to the effects set out in the ES for the consented project.

3.1.2 In doing so, KGSL has also considered whether the proposed changes would constitute 'EIA Development' for the purposes of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. It is the applicant's view that the proposed changes do not constitute Schedule 1 development.

3.1.3 Whilst the storage of hydrogen gas would be considered as Schedule 2 development in its own right the applicant is of the view that the effects of storage of hydrogen gas are the same or less than the storage of the consented natural gas storage.

3.1.4 On that basis the applicant contends that the introduction of hydrogen gas storage does not introduce any new environmental effects not previously assessed. Paragraph 13 of Schedule 2 provides that a change or extension to a Schedule 1 development or a change to a Schedule 2 development which has already been authorised will be Schedule 2 development only if *"the change or extension may have significant adverse effects on the environment"*. In considering whether or not that is likely, the changes are not to be assessed in isolation. Therefore the assessment must consider the overall effect of the proposed changes on the project baseline and identify whether the whole project, as modified, is likely to have (a) significant effects not identified within the original assessment or (b) greater effects than previously identified.

3.1.5 A summary of an updated assessment of the effects against topics for which an impact is possible is included within Table 3.1 below. The proposed changes do not impact on the following topics which have been scoped out of the updated Environmental Report:

- Traffic and transport;
- Noise and vibration;
- Soils and land use;
- Geology and land contamination; and
- Ground and surface water.

3.1.6 Please refer to the supporting Non-material Change Application – Environmental Report for further technical details on specific topics.

Table 3.1 – Summary of impact of changes by topic

Topic	Summary of Impacts of revised design
Ecology	Operating the site as a hydrogen storage facility instead of a natural gas storage facility is not considered to result in a significant difference to the ecological impacts outlined in the 2015 ES. Associated mitigation measures and the updated protected species information in the Protected Species Report (2021) appear adequate to date given the very minor changes in project foot print. It should be emphasised that the new locations proposed for the building and compound are sited on areas previously identified as laydown areas or car parking. No new greenfield development will occur and no increase in built development from that previously assessed will occur.
Air Quality	The proposed hydrogen gas processing plant does not involve the burning of any hydrogen within the plant. Process heat will be provided by electrical heaters. However, in general the burning of hydrogen rather than natural gas within new boilers specifically designed to burn hydrogen, will not significantly change the emissions of NOx. The baseline for sensitive human receptors will not be substantially different, particularly when considering that the baseline NO2 in the UK generally remains static or decreasing. The impact on sensitive ecological receptors from burning hydrogen will fall substantially below the 1% Critical Load therefore changes in the baseline or tightening the Critical Load will not generate a new significant impact. The emissions to air will not be materially affected by changing from natural gas to hydrogen, and will not change the prediction that impacts are negligible.
Landscape and Visual Impact	The review of the previously undertaken Landscape and Visual Impact Assessment (LVIA) of KGSP has concluded that there are no additional residual visual or landscape effects associated with the proposed non-material amendments to the Development and possibly some very minor incremental visual benefits, although not sufficient to change the previous magnitude of change and significance grading which have remained unchanged and not significant.
Cultural Heritage	Conclusions from the 2015 ES associated with the existing DCO remain valid, and there are no additional significant cultural heritage impacts arising from the changes proposed.

3.2 Review of potential effects associated with new topics identified in the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

3.2.1 The Environmental Impact Assessment which was prepared to support the application for the DCO was undertaken in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009, and included those matters identified in Schedule 4, Part 1, paragraph 19 of the 2009 Regulations. This non-material change application is being submitted in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the "**2017 EIA Regulations**"), which include assessment topics which were not addressed distinctly within the previous Environmental Impact Assessment. These topics include:

- Major Accidents and Disasters;
- Human Health; and
- Climate Change.

3.2.2 These topics were considered either within assessments which supported the DCO application, or within other assessments undertaken separate to the DCO. A summary of the impacts of Major Accidents and Disasters is included below.

3.2.3 Both Human Health and Climate Change have been scoped out of the assessment due to the nature of the proposed development. With regards to Human Health both natural gas and hydrogen gas are stored within the subsurface caverns and pipe network with no interaction with the human population. Any concerns specifically related to safety are assessed within the Major Accidents and Disasters section of the Environmental Report. Regarding the topic of Climate Change any impacts on climate due to emissions are covered under the greenhouse gas (GHG) emissions sections of the Environmental Report whilst other climate related impacts such as flood risk are addressed separately.

3.2.4 This provides a firm basis from which to undertake the following review of:

- effects associated with the project as approved; and
- the change in effects which this proposed non-material change would result in.

Table 3.2 – Summary of impact on new topics

Topic	Summary of Impacts
Greenhouse Gas Considerations	Factors such as the relative water content of the hydrogen during withdrawal operations, changes in equipment availability, and variance in periodicity of mode of operation could have a material impact on the GHG emissions from the site due to the potential for a requirement for greater preheating. However, there is no pre-heat requirement for hydrogen during letdown unlike natural gas, thus emissions generally will be much lower than that for natural gas processing. No significant changes to operational frequency for the storage facility are envisaged thus changes to the above factors are not expected to occur.

	Wherever possible all gas within equipment will be recovered back to storage during maintenance. However, should venting be necessary then the equivalent impacts from hydrogen will be lower, as hydrogen has a lower Global Warming Potential compared to that of natural gas. For these reasons it is considered that there are no significant additional impacts in respect of GHG considerations that would occur as a result of the storage of hydrogen when compared with the original consented project.
Major Accidents and Disasters	Compared to natural gas, hydrogen is a more reactive molecule with a low gas density, which has implications for material and equipment selection. Given a loss of containment, hydrogen can form flammable mixtures with air, resulting in jet flame and vapour cloud effects in the immediate vicinity, or the formation of a flammable cloud and a flash fire. However, the overall assessments for the facility indicate that the overall safety risks associated with hydrogen are comparable to natural gas. The plant is designed and will be constructed, operated and maintained to appropriate national and internationally recognised standards. Hazard evaluation has been carried out in a logical, semi-qualitative manner. This process has been supported by Hazard Identification (HAZID), HAZOP and risk assessment studies. It is expected that the risk assessment studies will be refined in the later stages in the KGSP design process. Those events that could be major accidents have been identified and linked with possible causes. The preventative and control measures have been listed, and measures to minimise the consequences have been analysed. A robust management of major accident hazards will need to be in place throughout the overall project phases. The KGSL technical team are producing a Pre-construction COMAH safety report, in order to support a demonstration that a robust management of major accident hazards is in place prior to the start of construction. It is expected that the safety report will be refined in the later stages in the KGSP design process. It should be noted that the risk to the development from external disasters (e.g. – natural disasters) remains the same regardless of whether natural gas or hydrogen gas is stored on site – i.e. the consented DCO baseline will not change. To conclude, it is considered that there are no material safety impacts arising from the proposed storage of hydrogen and the minor design changes when compared to the existing DCO and the storage of natural gas.

4 Consultation

4.1 Pre-application Consultation

4.1.1 The Infrastructure Planning (Changes to, and Revocation of, Development Consent Orders) Regulations 2011 do not require any statutory consultation prior to the applicant submitting an application under paragraph 2 of Schedule 6 to the Planning Act 2008. However, the applicant has undertaken the following approach to consultation in advance of this NMC submission.

4.1.2 The applicant has set up a local liaison group whose membership includes the LPA, ward members and Parish/Town council members in the vicinity of the main Site. The group has been meeting since 30th November 2021. The meetings provide an opportunity for two-way dialogue between Keuper Gas Storage Limited and the local community on the development of the Project.

4.1.3 At the first meeting in November 2021 the applicant introduced the subject of hydrogen storage as an alternative to natural gas storage with the benefits to climate change that this may provide.

4.1.4 The topic has been a recurring theme at each subsequent meeting of the group. In all cases, only general interest and a desire to understand more detail was expressed.

4.1.5 Over the last 12 months the applicant has held discussions with the 3rd party landowners of the land for the nine cavern sites not already in the ownership of the applicant or its parent company. See section 1.3 for details of land ownership.

4.1.6 In each case, with the exception of one land owner for one cavern, the landowners have either signed a deed of variation to support hydrogen storage where a land option agreement was already in place; or have signed a land option agreement that includes the option for hydrogen storage.

4.1.7 The one cavern not yet secured appears to be held up by discussions with the mortgage bank associated with the land. The bank have not signalled any issues that relate to hydrogen or gas storage, purely the financial position of their client. The 3rd party landowner in question has completed a land option agreement on two other cavern sites, without mortgage, that do include the option for hydrogen gas storage.

4.1.8 The existing KGSP website was updated to include information about the plans to include hydrogen storage.

4.1.9 Prior to the submission of the NMC application, the applicant has written to key stakeholders and local residents in the vicinity of the main Site. A newsletter, including a questionnaire which could be returned via Freepost, was sent to all addresses within a 3.5km radius of the site (2,113 addresses). The newsletter also included details of the updated website, public events (see below) and contact details.

4.1.10 The applicant held an online public Q&A session on 2nd November 2022.

4.1.11 The applicant held a public "drop-in" event at a local village hall on 3rd November 2022.

4.1.12 In the pre-application consultation, consultees were invited to respond to the applicant with questions or comments via the various channels that have been made available.

4.1.13 Further detail of the consultation undertaken and the comments received can be found in the Pre-application Consultation Report available at www.kgsp.co.uk.

4.2 Statutory Consultation

4.2.1 The applicant will write to those consultees identified in paragraph 7 (2) of the Infrastructure Planning (Changes to, and Revocation of, Development Consent Orders) Regulations 2011; with details of the application, a copy of the Regulation 6 notice, details of where copies of the other application materials can be viewed and details of where comments should be addressed.

4.2.2 The applicant will publish a copy of the Regulation 6 notice in the Northwich Guardian and the Runcorn and Widnes Weekly News advertising this application. The notice will be published in those newspapers on weeks commencing on 21st and 28th November 2022.

4.2.3 A date will be specified, 6th January 2023, for comments to be returned to the Planning Inspectorate, which is more than 28 days after the last publication in the newspapers and which allows for a Christmas holiday period.

4.2.4 A copy of the Regulation 6 notice will be displayed on site.

4.2.5 A further statement in accordance with Regulation 7A will be provided to the Secretary of State (via the Planning Inspectorate) after the last publication in the newspapers on 30th November 2022, to confirm the completion of the necessary steps and to provide a full list of consultees under Regulation 7 (2).

5 Conclusion

5.0.1 Keuper Gas Storage Limited is submitting an application for a non-material change to the Keuper Underground Gas Storage Facility DCO made pursuant to Schedule 6 of the Planning Act 2008 and Part 1 of the Infrastructure Planning (Changes to, and Revocation of, Development Consent Orders) Regulations 2011 (S.I. No. 2055).

5.0.2 The proposed amendment is for the storage of hydrogen gas as an alternative to natural gas. The inclusion of hydrogen gas storage on site necessitates the inclusion of an option for an alternative gas connection compound (Work No. 12). This would be located further away from the national transmission system (natural gas) pipeline than currently proposed.

5.0.3 In addition to the proposals for the inclusion of hydrogen gas storage within the DCO, the wider design of the Project has evolved since the granting of the original DCO. This design evolution has allowed the identification of a preferrable option, away from neighbouring sensitive uses, for the proposed siting and layout of one building (the Office, Control and Maintenance Building – Work No. 15) within the Site than was proposed in the original consent.

5.0.4 The inclusion of a second option for the location of the gas connection compound and the relocation of the Office, Control and Maintenance Building will therefore require a number of minor changes (updates) to the Certified Plans.

5.0.5 The applicant has assessed the proposed changes against the DCLG Guidance and is of the view that the proposed changes are non-material. This is supported by the accompanying Environmental Report which has assessed the updated design against the 2015 ES and concluded that no new or significant environmental effects have been introduced as a result of the proposed changes.

5.0.6 The Health and Safety Executive has concluded that there are no significant reasons on safety grounds for refusing Hazardous Substances Consent for the storage of hydrogen.

5.0.7 On the basis of the above the applicant is of the view the proposed changes are non-material and a Non-Material Amendment to the existing DCO should be duly granted.