



**Northern
Endurance
Partnership**



Humber Tranche 2 Business Case

Final Variation Submission

Q4 2025

NEP Expansion | Second Tranche of Humber Development Activities | Business Case

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1 Scope and Exclusions

This is the business case for the Second Tranche of Humber Development Activities in the Northern Endurance Partnership (NEP) Approved Project Development Plan (APDP).

With this business case, labelling of the APDP tranches is updated (refer to appendix A.1). The original Humber Tranche 2 is now split into Tranche 2 (1 Oct 2025 to 1 July 2027) and Tranche 3 (1 July 2027 to NEP Expansion FID).

Activities include preparation of the Development Consent Order (DCO) for submission, delivery of a Horizontal Directional Drilling (HDD) trial under the Humber estuary, surveys, and preparation for FEED entry at the start of Tranche 3. The scope includes Humber onshore and offshore activities.

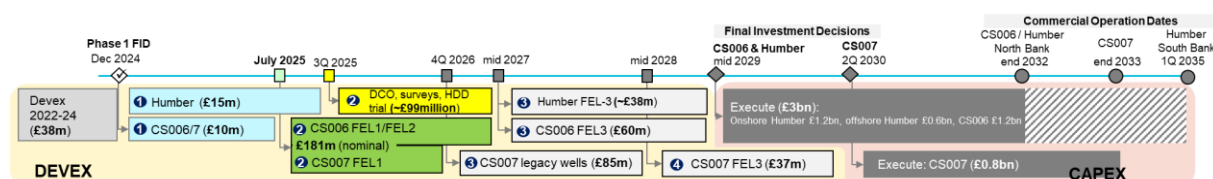


Figure 1 NEP Development Activities - this business case highlighted yellow.

Humber Tranche 2 is part of a larger set of Development Activities, working towards NEP Expansion FID, that also includes development work to mature the CS006 and CS007 offshore carbon storage licences, summarised in the business case NEP00-IR-REP-000-00004.

In this business case “NEP Expansion FID” refers to the Final Investment Decision(s) related to NEP Development Projects. NEP Expansion FID is subject to completion of the relevant tranches of NEP Development Activities.

Within this document COD refers to the earliest Commercial Operations Date of any of the NEP Development Projects. In detail, there are separate forecast CODs for the Humber North Bank & CS006 (“Humber North COD”), CS007 (“CS007 COD”), and Humber South Bank (“Humber South COD”). See **Figure 1**.

2 Reference Documents

Document Number	Document Title	Rev.
N/A	Approved Project Development Plan	Dated 9 th Dec 2024
NS051-PM-REP-000-00033	NEP Devex Report Phase 3, CAC4	B02, August 2024
N/A	NEP Capex Report Phase 3, CAC4	N/A, August 2024
NEP00-IR-REP-000-00004	NEP CS006 & CS007 Tranche 2 Business Case	B03, July 2025

3 Symbols and Abbreviations

AGI	Above Ground Installation
AID	Additional Investment Decision.
APDP	Approved Project Development Plan
BC	Bunter Closure (CO ₂ stores), e.g. BC39, BC40
CAC	Cost Assessment Checkpoint
CAPEX	CAPital EXpendature
CBS	Cost Breakdown Structure
CCUS	Carbon Capture Utilisation and Storage
CCR	Central Control Room
COSA	Construction & Operating Services Agreement (between bp & NEP)
CO ₂	Carbon Dioxide
COD	Commercial Operation Date
CP	Critical Path
CS	Carbon Storage (licence), e.g. CS001, CS006
CTR	Cost Time Resource
CBS	Cost Breakdown Structure
C&I	Control and Instruments
DESNZ	Department for Energy Security and Net Zero
DEVEX	DEvelopment EXpendature
DCO	Development Consent Order
DNO	Distribution Network Operator
DM	Dalcour McLaren
ECC	East Coast Cluster
EIA	Environmental Impact Assessment
EPC	Engineering, Procurement, Construction
ESIA	Environmental and Social Impact Assessment
FID	Final Investment Decision
FEL	Front End Loading (major project stages)
FEED	Front End Engineering Design
FOC	Fibre Optic Cable
FTE	Full Time Equivalent
GEMA	Gas & Electricity Markets Authority
H/O	Handover Date
HDD	Horizontal Directional Drilling
HCCP	Humber Carbon Capture Pipeline (project)
HGV	Heavy Goods Vehicle

HRA	Habitat Regulation Assessment
HoT	Heads of Terms
ITT	Invitation to Tender
IPMT	Integrated Project Management Team
LPA	Local Planning Authority
LLI	Long Lead Items
Mtpa	Millions of tonnes (of CO ₂ stored) per annum
MoGO	Management of Geophysical Operations
NDE	Non-Destructive Examination
NEP	Northern Endurance Partnership incorporated Joint Venture
NESO	National Energy System Operator
NSIP	Nationally Significant Infrastructure Project
NSTA	North Sea Transition Authority
NGV	National Gas Ventures
NZT	Net Zero Teesside
Ofgem	Office of Gas and Electricity Markets, the appointed regulator
OOM	Order of Magnitude
OPRED	Offshore Petroleum Regulator for Environment & Decommissioning
OPEX	OPerating Expendature
PEIR	Preliminary Environmental Infra
PSCM	Procurement & Supply Chain Management
P&ID	Piping & Instrumentation Diagram
PMT	Project Management Team
PO	Purchase Order
RFA	Reccomendation for Award
RFP	Request for Proposal
PP	Protective Provisions
RTA	Recommendation to Award
SoCG	Statement of Common Grounds
TBM	Tunnel Boring Machine
TCPA	Town and Country Planning
WBS	Work Breakdown Structure

4 Executive Summary

This is the Business Case for the Northern Endurance Partnership (NEP)'s Tranche 2 of Humber Development Activities. NEP proposes to split Tranche 2, as defined in NEP's Approved Project Development Plan (APDP), into Tranche 2 (this business case) and Tranche 3 (the remaining activities to NEP Expansion FID).

NEP requests approval for a cost allowance of £99.2 million (2Q25 basis) to progress the DCO to readiness for submission, deliver an HDD trial under the Humber estuary, acquire survey data, perform FEED contracting and prepare the business case for Tranche 3. The activities in Tranche 2 inform the scope, cost and schedule of Tranche 3, which will include FEED and EPC contracting ahead of the NEP Expansion FID.

A breakdown of costs (2Q25 basis) is included in **Table 1**. Of these costs:

- 48% is underpinned by firm bids and quotes
- 19% by estimates based on benchmarks,
- 15% is Project Management Team [PMT] cost, and
- 18% is contingency.

The HDD trial and the HCCP feasibility study are new development activities, aimed at enhancing the long-term value of the Humber project. These activities were not included in the 2024 CAC4 submission. The £18.8 million in **Table 1** is the cost of the HDD trial and civils contracts only. Including the share of PMT, engineering, surveys and consenting attributable to the HDD trial, its total cost is £29.5 million.

Cost Breakdown Structure (CBS) item	Cost (£million) 2Q25 Basis
Project Management Team (PMT)	£15.0m
Engineering and studies	£5.2m
Geotech and archaeological surveys	£19.3m
Consenting	£7.5m
Land	£14.0m
Trial HDD including water and roads	£18.8m
Offshore Humber surveys and studies	£1.2m
Feasibility study HCCP expandability	£0.3m
Contingency	£17.9m
Total	£99.2m

Table 1 Humber Tranche 2 Cost

5 Summary Table

Project: NEP Expansion				
Scope	CS006	CS007	Offshore Humber	Onshore Humber
Primary Investment Driver			Growth: expansion of the Approved T&S Network to emitters in Humber.	
Project Initiation Year (this tranche)			2025	
Project Close-out Yr (this tranche)			2027	
			Cost accuracy	
Devex ¹ up to NEP financial close (Dec '24)			£ 17.0 million	Actual
Devex ¹ Humber Tranche 1 (1Q24 Basis)			£14.7 million	+/- 10%
Devex ¹ (Humber Tranche 2) (2Q25 Basis)			£99.2 million	Class III
Devex ² (Humber Tranche 3)				Class IV
Capex (HCCP) ³				Class IV
Capex (offshore Humber pipeline) ⁴				Class IV
Devex – 2Q25 Basis (this tranche)			2025	2026
Spend Apportionment			£9.4M	£62.6M
				£27.2M

Table 2 Humber Tranche 2 Summary

¹ past and future Devex amounts for Humber only, not CS006/CS007.

² Devex of Tranche 3 indicative, and not requested for determination at this stage

³ Capex (RT Q1'25) updated to Class IV in 2Q 2025. Execute Capex depends on whether the Humber crossing is via tunnel or HDD and the number of spur lines to be included in the base case.

⁴ Capex (RT Q1'24) are as per the August 2024 CAC4 submission to DESNZ (offshore Humber pipeline only). The next update is anticipated in Q1'27.

6 Project Overview and Status

6.1 What is NEP, and what is NEP Expansion?

The Northern Endurance Partnership (NEP) project is a key component of the East Coast Cluster (ECC, **Figure 2**). The ECC will deliver large scale decarbonisation of the Teesside and Humber industrial clusters, through capture of CO₂ emissions at source and transportation and storage offshore. NEP delivers the CO₂ transportation and storage (T&S) infrastructure for the ECC.



Figure 2 East Coast Cluster

NEP announced Financial Close on 10 December 2024 for Phase 1 (4Mtpa capacity for 25 years) will take emissions from three users at Teesside (NZT Power, Teesside Hydrogen CO₂ Capture, and H2Teesside), transporting these to the Endurance store.

NEP's economic licence also includes studies to expand the asset, referred to as APDP Development Activities (**Figure 3 & Figure 4**).

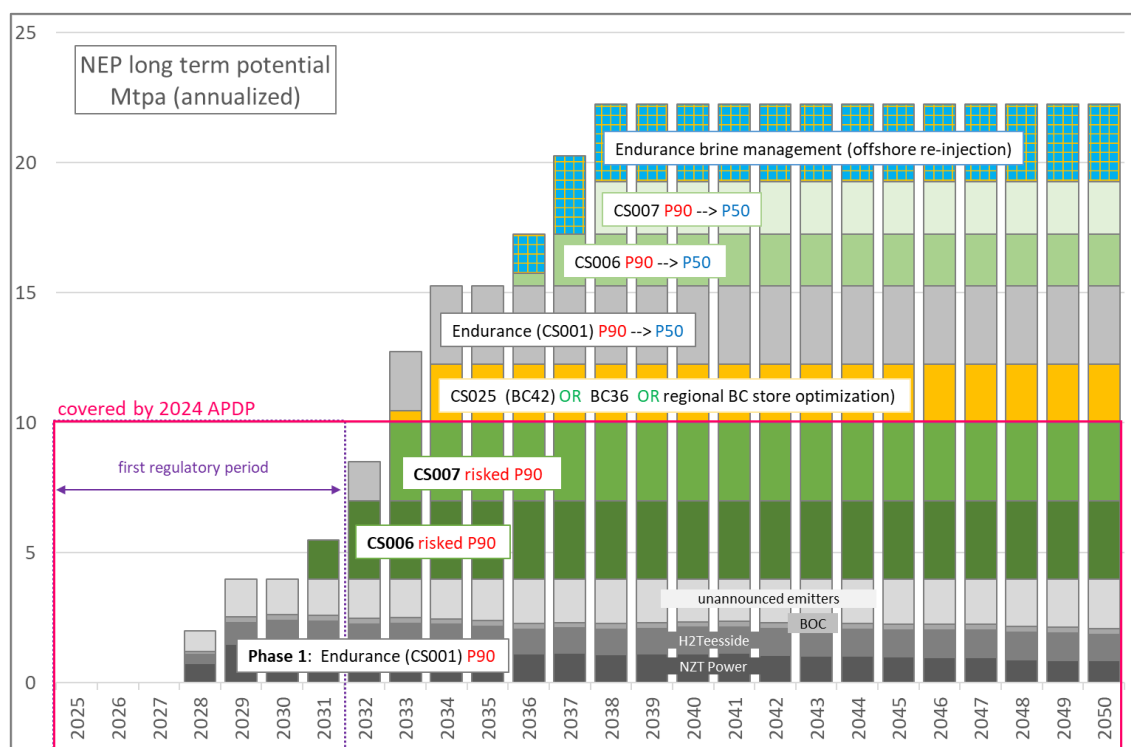


Figure 3 NEP long-term storage buildout

NEP has the potential to grow to over 20Mtpa (**Figure 3**), providing storage capacity to both Teesside (via the NEP phase 1 onshore gathering system and offshore pipeline) and to Humber (via the onshore Humber and offshore pipeline).

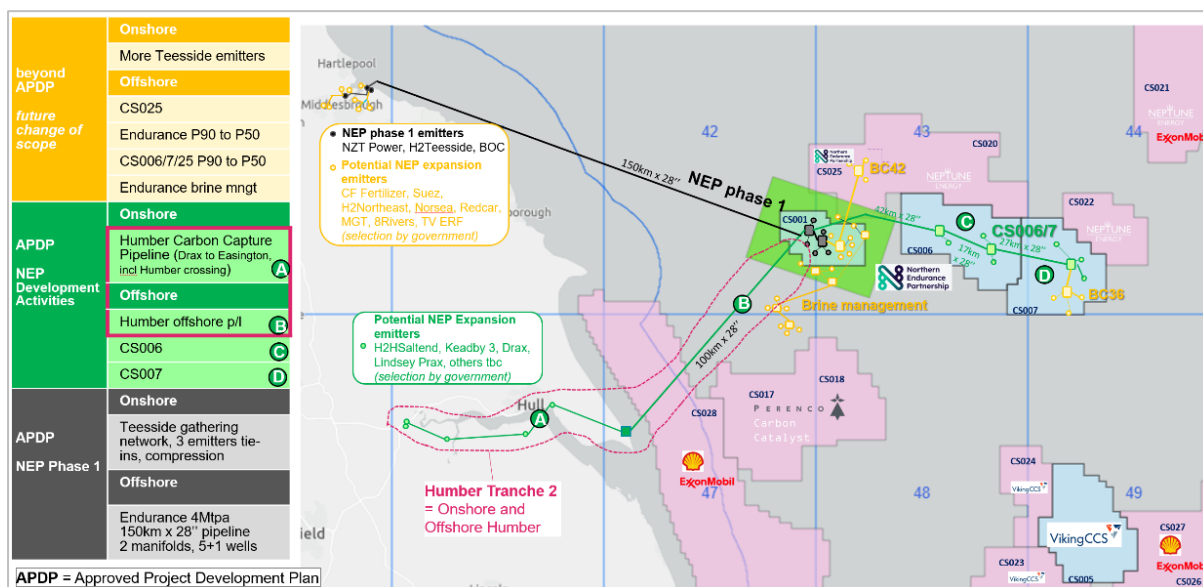


Figure 4 NEP APDP phase 1, APDP Development Activities and beyond

6.2 Project status

NEP Expansion comprises multiple projects, at different levels of maturity (**Figure 5**):

- **CS006 and CS007 (FEL1).** The CS006 and CS007 Carbon Storage Licences were awarded to NEP in 2022, with initial work commitments set by the North Sea Transition Authority (NSTA). NEP has completed the Early Risk Assessments for all four potential storage sites in CS006 and CS007, has acquired, processed and interpreted 3D seismic data in the CS006 block. The CS006/CS007 Tranche 2 determination was issued by Ofgem on 9 July 2025. This includes two appraisal wells, CS007 3D seismic, surveys and studies including FEL2 engineering.
- **Offshore Humber pipeline (FEL3).** The offshore pipeline between Humber and Endurance storage site was originally expected to be included in Phase 1 of the NEP project but is now part of Expansion. FEED was completed in 2023, with the route and pipeline design confirmed. This aspect of the project will require (pre) FEED re-validation and re-surveying (due to survey expiry) in 2026-28.
- **Humber Carbon Capture Pipeline (HCCP), (FEL2B).** In early 2024, NEP formally acquired the onshore Humber project from National Grid Ventures. The project centers on a new dense phase CO₂ pipeline serving multiple potential users in the Humber area, from Drax in the west, to a new terminal at Easington where CO₂ will be pumped into the offshore Humber pipeline. DCO non-statutory consultation was completed in 2024, pre-FEED engineering is largely complete as of mid-2025. DCO statutory consultation is ready to start in 4Q 2025.
- **Emitter Projects.** No users have been selected for NEP Expansion by DESNZ as of September 2025. The APDP assumes a route that serves Drax, Keadby 3, ZerCal250, Prax Lindsey, Phillips '66 and H2H Saltend. The HCCP DCO provides consenting for connection optionality to these assumed emitters. Should new or alternative emitters be selected, additional spur lines may be routed and consented separately. Allocation of users and their scope is outside of NEP's control but is needed to reach an overall East Coast Cluster Expansion FID.

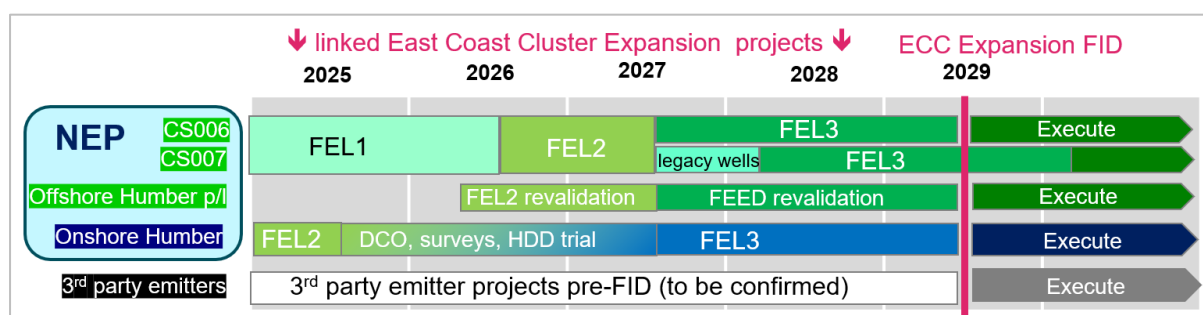


Figure 5 Maturity of NEP Expansion projects

6.3 Delivery of Humber Tranche 1 Development Activities

The NEP APDP section 5.3 (e) states:

The first Tranche of Humber Development Activities shall comprise all development activities required to enable the Licensee to progress from Licence Award to the commencement of the second Tranche of Humber Development Activities, including the following activities in respect of the Humber Onshore Transportation System:

- (i) early FEED, e.g. finalising the major scope decisions and developing the contracting strategy.*
- (ii) environmental surveys;*
- (iii) archaeological surveys.*
- (iv) negotiating land option agreements and procuring legal services;*
- (v) non-statutory consultation;*
- (vi) development consent order ("DCO") statutory consultation preparation; and*
- (vii) intrusive and non-intrusive surveys in support of the DCO and design development.*

These activities have been delivered, as follows:

- i. Key Tier 1 and Tier 2 decisions have been made and are documented in the pre-FEED reports. The contracting strategy for Tranche 2 activities is issued. The contracting strategy for FEED (now in Tranche 3) and Execute has been drafted and will be further updated and formally issued in Tranche 2.
- ii. Completed environment surveys required to support statutory consultation and DCO development, including: wintering/passing birds (Season 1), intertidal, landscape (Phase 1), geology, otter and water vole (Phase 1), ecology (Habitat Phase 1), reptiles, noise, bat static (Phase 1) and traffic and transport.
- iii. Completed archaeological surveys include: heritage walkover, geophysical archaeology (Phase 1).
- iv. Secure access to the order limits for the surveys (non-intrusive licences), development of the agreements for next phases.
- v. Non-statutory consultation was completed in 2024.
- vi. The project is preparing for Statutory Consultation to commence early in Tranche 2. The Environmental Impact Assessment scoping report was issued in January 2025 and adopted in February 2025. The Preliminary Environmental Information Report (PEIR) is being prepared in accordance with the Planning Act 2008 and the Environmental Impacts Assessment Regulations. The PEIR is intended to inform consultees of the likely significant environmental effects of the proposed development and to support meaningful engagement during Statutory consultation.
- vii. Other surveys completed include: drainage and soil survey of the Order Limits, topography and ground penetrating radar for Trial HDD and Above Ground Installation (AGI), engineering geophysical survey for Trial HDD, Heritage geophysical and trenching survey of the Trial HDD sites.

7 Problem and Opportunity Statement

In 2021, the East Coast Cluster was selected as a Track 1 cluster on the basis of Teesside and Humber cluster decarbonisation.

CO₂ transportation networks connect emission sources to safe and permanent subsurface storage. NEP holds four storage licences: CS001, CS006, CS007 and CS025. The UK's first ever storage permit was granted in December 2024 for CS001 (Endurance).

The Humber offshore pipeline FEED was completed in 2023, as part of Phase 1. Offshore Tranche 2 appraisal of CS006 and CS007 stores is progressing following Ofgem determination in July 2025, with two appraisal wells in 2026. This targets a risked, P90, annual storage capacity of 6Mtpa (unrisked, P50: 13Mtpa). With anticipated growth in CS001 capacity following NEP phase 1 start-up, NEP expects to have available between 10 Mtpa (risked, P90, without Endurance growth) to 20 Mtpa (unrisked, P50, with Endurance growth).

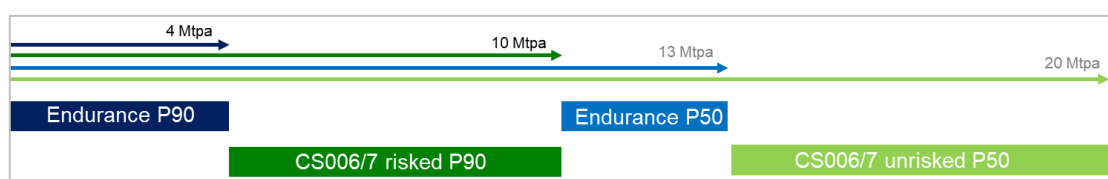


Figure 6 NEP storage capacity projections

To fully integrate the Humber 17Mtpa system as this project progresses to FID, the Humber onshore pipeline plus emitter selection needs to be progressed.

The Humber Carbon Capture Pipeline (HCCP <https://nephccp.co.uk/>) has undergone pre-FEED activity and is now ready to progress to statutory consultation under the Development Consent Order (DCO) planning regime as a Nationally Significant Infrastructure Project (NSIP). During this Tranche 2 period, HCCP will be refined to:

- maximise value opportunities such as the Horizontal Direct Drilling (HDD) trial
- reduce risk by undertaking surveys as required for the DCO
- firm scope options to reduce land take whilst establishing strong relationships with key local stakeholders early to secure key agreements
- improve cost and schedule certainty through the FEED contracting process.

Towards the end of Humber Tranche 2 (from end 2026), information from the activities above coupled with appraisal outcomes of the CS006/7 stores will enable NEP to update the NEP expansion base case. If the HDD trial is successful, Capex savings of £300m and a 2-year shorter construction duration – relative to a tunnel crossing of the Humber – may be realised. This value opportunity is important to ensure that the Humber development of the East Coast Cluster can meet the intent of the net zero national policies whilst providing certainty to emitters on the availability of CO₂ T&S capacity.

The Humber onshore and offshore pipelines will connect Humber emitters to NEP's offshore stores. Key benefits of the project include:

- The Humber onshore and offshore pipelines are vital to the decarbonisation of industry in Humber - the UK's most carbon intensive region.
- The Humber is home to several fossil fuel power stations and industrial plants that contribute millions of tonnes of carbon dioxide into the atmosphere every year, making

it the ideal location for new technologies for clean energy, using Carbon Capture, Usage and Storage (CCUS) technology.

- The project could put the Humber region on the map as a national leader in decarbonising industrial clusters.

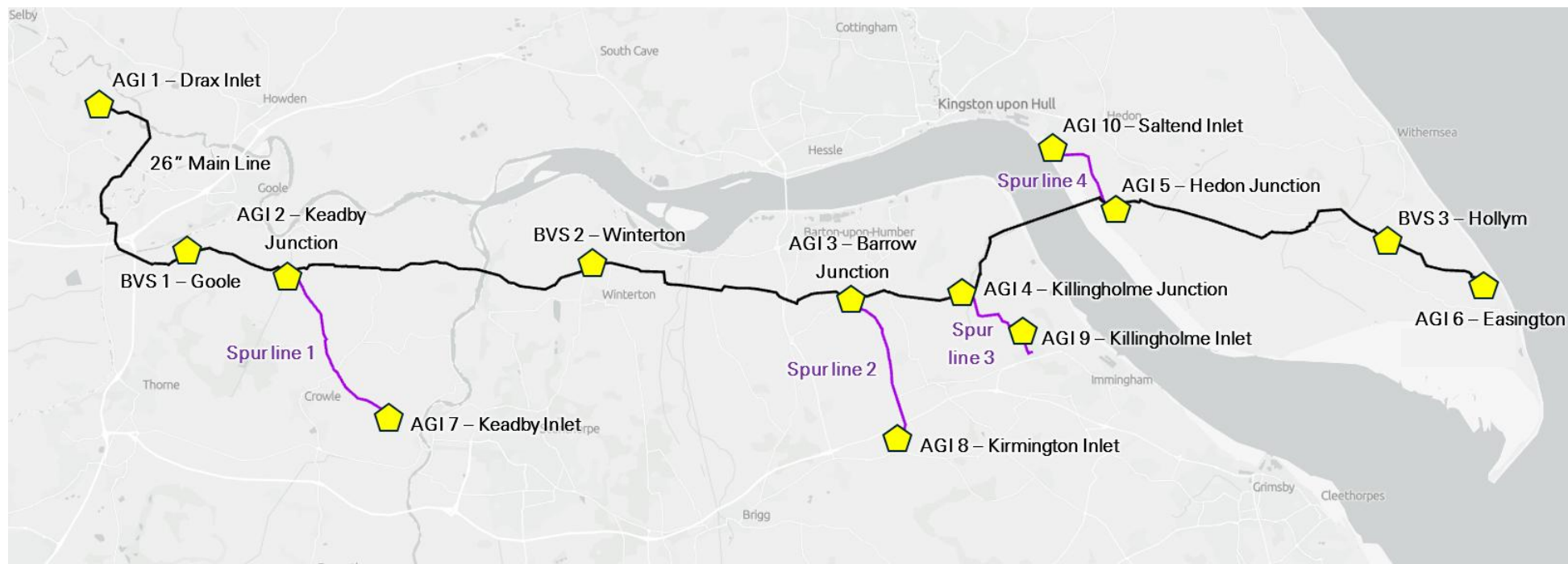


Figure 7 Onshore pipelines connecting Humber to offshore CO₂ storage

8 Project Definition

This section documents the proposed Humber Tranche 2 scope corresponding to the budget detailed in section 11. Section 8.2 breaks down the scope into key deliverables. Section 8.3 explains *how* the scope will be undertaken, including contracting of 3rd party work.

Section 9 explains *why* these scope choices were made, by comparing the proposed scope to alternatives.

8.1 Scope overview

NEP will, in Humber Tranche 2:

1. Close out HCCP technical scope decisions and deliver engineering in support of the DCO.
2. Undertake DCO statutory consultation; prepare and submit the HCCP DCO.
3. Secure land access to enable activities in this Tranche (intrusive and non-intrusive) and progress to develop, negotiate and execute where applicable agreements (Heads of Terms, Statement of Common Grounds, Protective Provisions and Option agreements) for long-term land access.
4. Gather additional geotechnical data through the enhanced ground investigation, utilising Horizontal Directional Drill (HDD trial) under the Humber estuary.
5. Acquire remaining HCCP survey data to support the DCO submission and inform FEED scope.
6. Engage with Humber emitters and the Track 1 expansion process.
7. Update and implement the HCCP contracting strategy to enable the commencement of FEED at the start of Tranche 3.
8. Prepare for HCCP FEL-3 entry, including verification.
9. Re-validate the offshore Humber pipeline Tier 1 and Tier 2 decisions.
10. Re-survey the offshore Humber pipeline, prepare and contract for offshore Humber FEED revalidation activities in Tranche 3.
11. Develop the business case to commit to FEED and all other FEL-3 activities up to NEP Expansion FID: Humber Tranche 3.
12. Undertake a feasibility study on HCCP expandability

8.2 Scope breakdown

8.2.1 Close out technical decisions

The following technical scope decisions will be completed in Tranche 2.

- Central Control Room (CCR) location decision. The reference case location is at the Easington pump station, Humberside. As an opportunity for improved operability, a change of reference case to the NEP/NZT Teesside CCR will be assessed (along with the required secure communications). The objective is to realize operational synergies and OPEX reductions for NEP.
- Selection of power supply to Easington pump station, subject to the Distribution Network Operator (DNO) and National Energy System Operator (NESO) studies.
- Humber crossing decision:
 - for the pipeline, subject to HDD trial findings and conclusion.
 - for telecommunications, subject to HDD trial findings, and telecommunications studies.

8.2.2 Deliver engineering in support of the DCO

Engineering deliverables in support of the EIA and DCO submission and examination will include:

- Support during Statutory consultation.
- Pipeline routing and construction corridor refinement following statutory consultation. Development of final order limits for examination.
- Refinement of AGI and pump station footprint, visual and environmental impact, and construction impact: Preliminary P&IDs, 3D model (30%), civil architectural drawings and preliminary foundation design, preliminary electrical, lighting and CP design.
- Integrated Control and Safety System specification and interface with NEP phase 1.
- Development of interfaces with Emitters.
- Development of interfaces with NEP Expansion offshore, and NEP phase 1.
- Development of interfaces in support of crossing agreements with 3rd parties (e.g. Road, Rail, Pipelines, Drainage)

Support to consenting and land agreements during DCO preparation, and during examination.

8.2.3 DCO application, preparation and submission

As part of regulatory requirements, the Humber Carbon Capture Project requires the preparation, submission, and approval of the DCO, and given its complexity, presents a significant challenge from the execution and scheduling perspective.

Activities include but are not limited to:

- Preparation and delivery of statutory consultation, with the subsequent change control.
- Updating PINS (Planning Inspectorate) engagement strategy and stakeholder engagement, including with PINS, local authorities, Environment Agency, etc.
- Carrying out environmental, archaeological, geotechnical and other required surveys in support of the EIA, DCO submission and project development.

- Ongoing monitoring of local planning activity
- Preparation of the Full Environmental statement and DCO submission requirements (e.g. DCO Application Form, DCO Application Cover Letter, Needs Case for DCO Development, Planning Statement, Design and Access Statement, Pre-Application Programme Document, DCO Guide to the Application, S55 checklist, Consultation Report, Adequacy of Consultation Milestone Report, Statement of Reasons, Statement of Community Consultation, etc.)
- Planning applications and Planning statement
- Biodiversity net gain calculation and report
- Habitats Regulations Assessment (HRA) screening
- Support during DCO examination.

8.2.4 Secure land access to enable activities in this Tranche

An experienced Land Agent will lead negotiations on behalf of NEP, in line with the DCO plan, to facilitate legal access to land by the Project, supporting the activities described in this document. The Project will enter into legally compliant agreements with the appropriate landowners. The form of the agreements may take different forms based on the specific circumstances of the land parcels. The Land Agent's scope includes the development of the Head of Terms, Options Agreements, Deeds of Easement, Leases, licences and associated payments, as well as the support and development of the deliverables required to support DCO application (e.g. side agreements, statement of common grounds, protective provisions, memorandums of understanding, book of references, work packs and plans etc.).

External legal specialist support is required for the DCO development, application, land agreements, HoT, SoCG, side agreements and project agreements required during Tranche 2.

8.2.5 Plan and execute an HDD trial under the Humber estuary

The project base case for the river Humber HCCP pipeline crossing is tunnelling. NEP has identified an opportunity to use a significantly less time and capital-intensive technique – horizontal direction drilling (refer to Section 9.2). However, the combination of the line pipe size, length of the crossing and geological conditions of the crossing is challenging and unprecedented. It requires further investigation of the local ground conditions (enhanced ground investigation – Trial HDD) to verify whether the HDD methodology can be used in execution with an acceptable level of risk.

8.2.5.1 HDD trial permitting

To enable the project to execute the enhanced ground investigation using the horizontal directional drilling technique (trial HDD), a Town and Country Planning (TCPA) application is required, and has started in Tranche 1.

The contractors will undertake several key activities to enable TCPA development, application and investigation execution, an example of which is outlined below:

- Submission of the planning application to the East Riding of Yorkshire Council and North Lincolnshire Council
- Applications to discharge planning conditions

- Applications to discharge Marine Licence Conditions
- Marine Management Organisation notifications
- Discharge Consent Management etc.

8.2.5.2 HDD trial execution

Upon approval by Local Planning Authorities (LPAs) via the TCPA, HCCP will then work with a civils contractor to establish the civil infrastructure required to support Trial HDD activities. This includes the provision of the civil pads and relevant civil infrastructure, access roads with passing points etc.

Once civil infrastructure is developed, HCCP will engage with an HDD contractor to conduct enhanced ground investigation using the horizontal directional drilling technique. This will be conducted from both sides of the river Humber. Exact technical parameters of the investigation will be coordinated and determined with the input from the specialist contractor to ensure an effective and efficient investigation with the optimum number of parameters gathered and assessed.

8.2.6 Acquire survey data to support the DCO submission and inform FEED scope

Both non-intrusive and intrusive surveys are required to support and inform the project's designs and DCO submission for the onshore pipeline routing, including the Humber river crossing design.

The contractors will undertake several activities, including:

Engineering surveys

- Over water and over land geophysical investigation
- Over water geotechnical investigation (boreholes)
- Over land geotechnical investigation (boreholes and trial pits)
- Soil resistivity survey, topography survey, and drainage survey

Environmental surveys

- Soil investigation reporting.
- Environmental and Heritage Surveys (e.g. fish surveys, geoarchaeology, archaeology geophysics, trial trenching, Phase 2 Botany, Bat Roosts, Badger survey etc.)

8.2.7 Engage with Humber emitters and the Track 1 expansion process

The project will engage with potential Emitters to ensure that Emitter and NEP designs are developed in line with end-to-end 'full chain' requirements.

Subject to government direction on the Track 1 expansion process, it is expected that NEP will undertake technical studies with CO₂ emitters in Humber. Technical topics include:

- Process engineering, flow assurance, and process safety assessments
- Local routing studies.

The following Humber related holds in the Pipeline Entry Specification and Emitter interfaces are to be developed in Tranche 2: over-pressure and over-temperature operating limits, and

compositional excursion protection; spur line routing and inlet AGI location; and first-fill, commissioning and start-up capability.

8.2.8 Implement the contracting strategy to enable the commencement of FEED at the start of Tranche 3.

In Tranche 2, the FEED scope of work will be fully developed, accounting for technical decisions taken in Tranche 2. Steps include market engagement, contract model selection, development of the Recommendation for Proposal (RfP), bid evaluation, and development of the Recommendation for Award (RfA) ready for contract award.

8.2.9 Prepare for HCCP FEL-3 entry, including verification

In line with major projects common practice, NEP will complete pre-FEL3 project-internal verification including class IV (-30%/+50%) Capex update, schedule to COD, Decision Verification and Project Execution Plan. Independent external benchmarking will be undertaken.

8.2.10 Confirm the offshore Humber pipeline Tier 1 and Tier 2 decisions

For the avoidance of doubt: Humber Tranche 2 also includes limited work related to the *offshore* Humber pipeline.

This will include assessing that the major scope decisions made prior to FEED entry in 2022 remain valid. For example, that the landfall location and alignment is still available and optimal.

As per the 2024 APDP agreed with DESNZ, the target Humber onshore and offshore pipeline capacity is 17 Mtpa, which corresponds to a 28" diameter for the offshore line.

8.2.11 Re-survey the offshore Humber pipeline, prepare and contract for offshore Humber FEED revalidation activities in Tranche 3.

The offshore Humber 28" pipeline (Easington to Endurance) was part of the NEP phase 1 FEED in 2022. Following the DESNZ decision in 2023 to not select any Humber emitters, the offshore Humber pipeline was moved from Phase 1 to Expansion scope. Some re-surveying is required by OPRED due to the time lag since the 2021 survey data.

Tranche 2 scope includes:

- Acquire re-validation sample data of the Humber to Endurance pipeline route in summer 2026 to inform Environmental Statement preparation in 2027.
- Confirm the scope of any FEED revalidation required in Tranche 3 and prepare for contract award.

8.2.12 Develop the business case to commit to FEED and all other FEL-3 activities up to NEP Expansion FID: Humber Tranche 3.

- Prepare a level 2 schedule for Tranche 3 activities up to NEP Expansion FID.
- Prepare devex estimate for Tranche 3 activities up to NEP Expansion FID. In addition to FEED, this includes contracting or estimating major 3rd party spend.
- Draft the Tranche 3 business case, review with Ofgem and DESNZ. Submit business case to Ofgem, for approval. Submit business case to DESNZ for approval of variation notice.

8.2.13 Undertake a feasibility study on HCCP expandability.

- Assess the feasibility of an onshore connection between proximal CCS network(s) and HCCP. Connecting emitters to two Transportation & Storage networks could improve overall system reliability, in the event of offshore downtime or capacity constraints.
- Assess the feasibility of increasing the capacity of HCCP beyond 17Mtpa. This would allow more emitters to connect to HCCP (and other proximal CCS networks), lowering CO₂ transportation cost per ton.

The impact of any optimisation on HCCP schedule will be included in the feasibility study.

8.3 Scope breakdown: how

This section covers the procurement strategy: how the scope will be delivered.

8.3.1 DCO statutory consultation, DCO submission and consenting

NEP proposes to deliver the scope with the support of the following incumbent contractors:

Contractor	Scope
Arcadis	Overall consenting support, TCPA, DCO Development and Submission
Dalcour Maclaren	Land Agency Services and Referencing support
Addleshaw Goddard	Legal support for TCPA and DCO
Wood	Engineering support for DCO

Table 3 Humber Incumbent Contractors

8.3.2 Plan and execute an HDD trial under the Humber estuary

The overall scope for the HDD trial will be delivered through the following contractors:

- [Civils Contractor]: an agreement with a Civil enabling contractor to enable the HDD trial execution and drilling. As of end August 2025, NEP is completing commercial clarifications with the preferred bidder.
- [HDD drilling Contractor]: an agreement with an execute HDD contractor. As of end August 2025, NEP is completing commercial clarifications with the preferred bidder

8.3.3 Acquire survey data to support the DCO submission and inform FEED scope

The overall scope will be delivered through the following contractors:

- An agreement with a Geotechnical and Geophysical contractor(s) for the overwater scope. This will be competitively bid in Tranche 2 to identify the preferred contractor for this scope.
- An agreement with a Geotechnical and Geophysical contractor/s for the overland scope. This will be competitively bid in Tranche 2 to identify the preferred contractor for this scope.

8.3.4 Implement the contracting strategy to enable the commencement of FEED at the start of Tranche 3.

Contracting for Tranche 3 activities, including FEED will build on the draft FEED/Execute contracting strategy developed in Tranche 1.

8.3.5 Develop the business case to commit to FEED and all other FEL-3 activities up to NEP Expansion FID: Humber Tranche 3.

The Tranche 3 business case will be developed towards the end of Tranche 2. Early engagement with Ofgem and DESNZ will be sought to reduce potential non-productive project time during reviews before Tranche 3 approval.

9 Options Selection

The key choices that drive this business case are:

1. **What:** Split Humber Tranche 2 into Tranche 2 and Tranche 3 and defer FEED.
2. **What:** Deliver a Horizontal Directional Drilling (HDD) trial.
3. **When:** Continue DCO statutory consultation to reduce the risk of NEP Expansion FID delay from any future challenge to the DCO.
4. **How:** Competitively bid the largest 3rd party contracts.
5. **How:** Roll over ongoing 3rd party contracts, to build on the experience and knowledge of the project and where re-contracting would be inefficient and uneconomic.

9.1 Split Humber Tranche 2 and defer FEED.

The 2024 APDP defines a single Humber Tranche 2, from the start of DCO statutory consultation to NEP Expansion FID. It is the tranche with the longest duration (estimated at 3 years in CAC3). When the breakdown into tranches was developed by DESNZ and NEP in 2024, it was recognised the splitting up the tranche in the future might be beneficial, and the economic licence was written to allow for this.

With this business case, NEP proposes to split the original Tranche 2 scope as illustrated in Table 4.

	APDP Humber Tranche 2 development activities	Proposal
Onshore Humber	DCO application, preparation and submission	Complete in Tranche 2
	FEED (other than FEED activities undertaken in the first Tranche of Humber Development Activities)	Defer to Tranche 3 (start FEED at start of 3)
	ground surveys including a horizontal directional drilling trial in relation to the Humber Crossing	Complete in Tranche 2
	engineering studies for procurement of long-lead items	Include in Tranche 3
	supply chain procurement activities, including market engagement, expression of interest and request for proposal ("RFP") preparation	In 2: procurement for Tranche 3 activities In 3: procurement for Execute
	DCO examination and approval process	Include in Tranche 3 (submit DCO at end of 2)
	decision on Humber Crossing method	Complete in Tranche 2, subject to HDD trial results
Offshore Humber	FEED revalidation	Include in Tranche 3
	environmental surveys revalidation	Include in Tranche 2
	undertaking of a Competent Person's Audit in respect of: (aa) an expansion or enhancement of the Endurance Storage Site; (bb) the CS006 Storage System; or (cc) the CS007 Storage System, and provision to the Regulator of a Competent Person's Report in respect of the same which classifies: (a) Storage Capacity; or (b) Contingent Storage Resources as being in or above the classification "Development Pending" (as each such term is defined in the SRMS Guidelines), and in the case of an expansion or enhancement of the Endurance Storage Site, the total Storage Capacity and Contingent Storage Resources being in excess of the "Maximum Annual Cumulative Flow" (as identified in section 3.3(c) of this APDP, and which forms part of the Obligated Network Capacity)	This activity relates to CS006/CS007, not offshore Humber. NEP proposes to move these activities, subject to the results of the appraisal wells and legacy well remediations, to: CS006 Tranche 3, and CS007 Tranche 3.
	supply chain activities, including market engagement, expression of interest, RFP preparation, procurement process, bid evaluation and recommendation to award and contract	In 2: procurement for 2 activities In 3: procurement for Execute
Integrated activities	management and execution of legal, financial and technical due diligence (and any other related advisory activities) associated with the raising of capital in respect of the Humber Expansion	Include in Tranche 3

Table 4 Split of Humber Tranche 2 activities into Tranches 2 and 3

FEED deferral into Tranche 3 is proposed for the following reasons:

- The 2024 CAC3 schedule assumed that DESNZ would select Humber emitters in 4Q 2024. This did not happen. Confirmation of emitters is important for delivery of a more efficient, as better-defined, FEED scope, reducing the potential for re-work.
- As an indirect consequence of the Judicial Review of the DESNZ Secretary of State's approval of the NZT/NEP DCO, the Bunter Closure 39 (BC39) appraisal well spud date was deferred to 2026. This appraisal well and the follow-on offshore activities form the critical path to an integrated NEP Expansion FID. The float that has resulted means that starting onshore Humber FEED in 2025 is not necessary; it would then finish nearly three years before NEP Expansion FID.
- The HDD trial was identified in 2024 as an opportunity to de-risk the execute capex and schedule. By delaying FEED, a single option (tunnel or HDD) could be taken into FEED, instead of two.
- In the unlikely event of disappointing appraisal well results from the BC39 and BC37 wells in 2026, the decision could be taken to pause the Humber project and not proceed into FEED.

A single Humber Tranche to NEP Expansion FID would have a duration of c. 4 years. Making an accurate determination on costs for the latter half of that period is difficult, as project scope and timing may evolve due to offshore appraisal well results and government decisions on emitters. Splitting Tranche 2 makes it possible to provide a more accurate cost estimate for activities in 2027-2029, than can be made at this early stage. Estimating the full Tranche 2 now, would require a large contingency.

9.2 Deliver a Horizontal Directional Drilling (HDD) trial

To connect emitters on both sides of the Humber to NEP's offshore CO₂ transportation network, the Humber Carbon Capture Pipeline needs to cross the Humber estuary. At the optimum location, this is a distance of 4.6km.

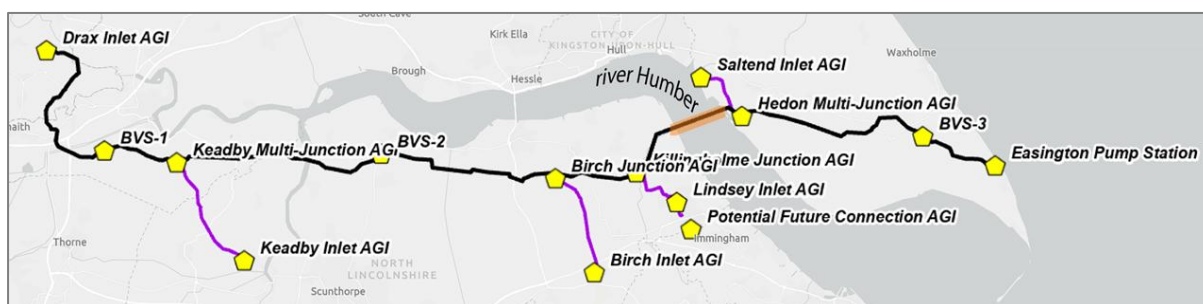


Figure 8 The HCCP route with the Humber estuary crossing shaded in orange

There are two main construction methodologies for this crossing: tunnelling or horizontal direction drilling (HDD).

Laying a large-diameter dense phase CO₂ pipeline on and across the riverbed is not recommended.

Tunnelling

National Grid Ventures' Feeder-9 project was successfully completed using this technique.

NEP estimates a (class IV) cost of ~£300million and a 5 year and 10-month execution duration. The CAC3 schedule and CAC4 (class V) Capex held the tunnel as the HCCP reference case, Furthermore, following the engagement with the local stakeholders, including residents, under the umbrella of public consultations, it was determined that the Feeder 9 execution caused significant public feedback regarding local traffic management. Future activities of the same scale (i.e. new tunnel) would require developing an alternative solution for the traffic management in general and water supply in particular, which presents a significant challenge due to the limited options and will adversely affect the schedule and cost.



Figure 9 Representative tunnel set up – NGV Feeder 9 Project

Horizontal Direction Drilling (HDD)

The typical HDD execution duration is 2 to 4 times faster than tunnelling. There is also a major cost benefit, and a significant reduced impact to the local environment in terms of construction footprint and volume of construction traffic. The NEP Expansion project in Tranche 1 engaged with two HDD contractors to assess technical, cost, schedule and consenting feasibility and risks. An estimate of £40 MM ($\pm 40\%$) for a full HDD was developed, which includes conditioning (Fibre Optic Cable installation, enabling works, water provision, civil and reinstatement).

However, there is an execution risk as an HDD of this length and diameter combination has not been completed before. Probability of success is estimated at 50% by experienced HDD contractors.

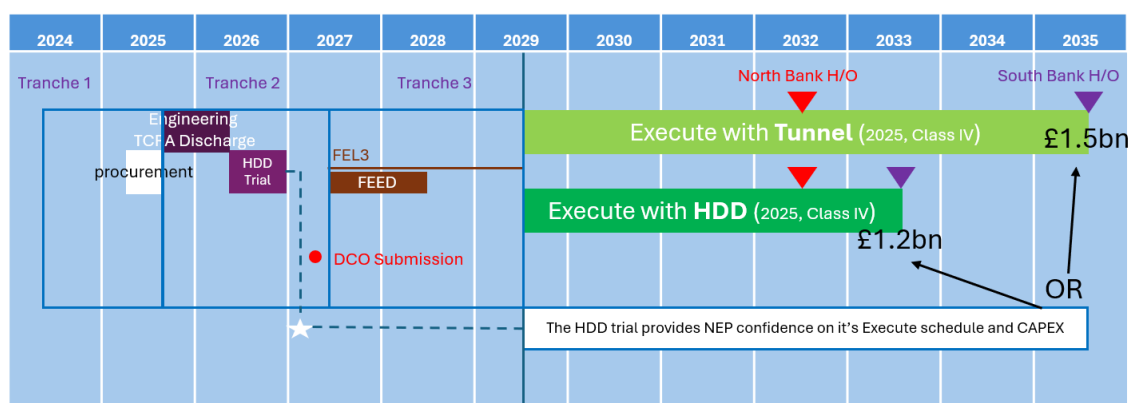


Figure 11 The HDD trial informs the Execute Capex and Schedule

Without the information from the HDD trial, the project could take both options into Execute, but this would involve major cost contingency and uncertainty on schedule to COD for South Bank emitters. Refer to section 11.5 schedule risks and opportunities.

9.2.1 Water supply for HDD drilling

The project evaluated options for the water supply for Trial HDD activities and selected tankering. The volume of required water for trail HDD, main construction HDD and tunnelling scopes were calculated. This fed into reviewing all supply options, these were:

- Abstraction (from the Humber, Streams, boreholes)
- Barge delivery
- new Pipelines
- Tankering

In the local area, the ground water is low, abstraction from streams and boreholes do not provide the water supply needs for the work. Abstraction from the Humber would require additional equipment, treatment, as well as anchoring a barge within the Humber, potentially damaging irreplaceable habitat and adding the noise of a generator for pumping. A jetty could not be created for the barge, as this would damage irreplaceable habitat.

Pipelines and Tankering were considered the only technically possible options that did not damage irreplaceable habitat and were investigated in more detail.

The potential for pipelines to supply both sides of the Humber works were confirmed by the water companies. The schedule, proposed routes and costs confirmed. The pipelines construction will dig up local roads and be laid through farms and fields, there will be environmental impacts from this work and Heavy Goods Vehicles (HGVs) will be used. The duration to install the pipelines is approximately 8 months.

In parallel, a traffic survey of proposed construction routes (which were determined with the assistance of the local highways teams, reviewed with local Councillors, police and presented to local residents) was undertaken to provide a traffic baseline. The proposed routes disrupt the least amount of residents as possible. On the North side of the Humber the Project is seeking agreement to use a private road to reduce the impact. On the South side a one-way system for HGVs will be used to spread the traffic, reducing impact.

With this further detail, an assessment of the baseline traffic and additional construction traffic was compared to the worse case water supply traffic and considered if the traffic for the water supply was removed. The benefits of removing the water supply HGVs traffic are not proportional to the additional risk of 3rd party programmes, environmental impacts and increase in cost for the Pipeline option.

The water supply strategy for the Main HDD or Tunnel will be reassessed once the Trial HDD has been completed and actual water supply numbers are obtained.

9.3 Progress a high-quality DCO at pace

An approved Development Consent Order is required for FID; it is a key asset for the Humber Carbon Capture project to secure.

The UK DCO process takes several years to complete, from freezing the main scope (in the case of a pipeline, the route), through non-statutory consultation, statutory consultation and examination to approval. Furthermore, it is possible for the DCO approval to be challenged via judicial review as has happened with the NZT/NEP DCO that was approved in 1Q 2024, and with HyNet in August 2025.

To minimise the risk of the DCO delaying FID, NEP proposes to:

- Progress the DCO at pace. This includes statutory consultation at the start of Tranche 2, subsequent analyses, and implementation of the change control. This will be followed by the engagement with the main stakeholders to progress relevant agreements (HoT, SoCG, protective provisions, etc), the development of the EIA and, ultimately, the DCO submission.
- Invest in high-quality survey data, consenting documentation and legal review.

9.4 Competitively bid the largest 3rd party contracts

4 key contracts will be competitively tendered out in the market. Value will be demonstrated through competitive bids received from multiple contractors, ensuring the best value for money and transparency.

[REDACTED]

9.5 Roll over ongoing 3rd party contracts

Refer to appendix A.3 for a detailed discussion.

10 Business Case Outline and Discussion

10.1 What is the value of this activity?

The East Coast Cluster was selected in 2021 as one of two UK Track 1 CCS clusters, to provide CO₂ storage services to industrial emitters at Teesside and Humber. In December 2024, NEP's economic licence and associated APDP were approved, providing access to three emitters at Teesside.

In support of the UK's decarbonization and growth goals, NEP Expansion seeks to extend CO₂ transportation and storage services to the Humber, the UK's largest industrial cluster. Taking advantage of NEP phase 1 learnings and synergies, this will improve network utilization & flexibility and reduce overall cluster abatement costs.

The proposed Humber Tranche 2 development activities:

1. Progress the schedule to Humber FID by de-risking the critical path activity: the Development Consent Order,
2. Inform the Humber crossing methodology, reducing cost and schedule risk in Execute, and potentially reducing Execute Capex by ~£300million and improving the Execute schedule by 2 years,
3. Prepare for the commencement of FEED in Tranche 3, by acquiring survey data and incorporating information from the Track 1 Expansion process expected to be launched by DESNZ,

combined with the CS006/7 Tranche 2 activities approved in July 2025, Humber 2 Tranche activities will de-risk the path to a Final Investment Decision. By 2027, both the offshore and onshore components will have matured sufficiently to propose the final steps to a cluster expansion decision within the current parliamentary period.

10.2 What happens if we do not do this activity?

[REDACTED]. The project, including the DCO currently in progress will then be paused. Restarting the project at a future date would require rebuilding a team, with a corresponding loss of continuity and experience. HCCP when restarted will be on the critical path to NEP Expansion FID, delaying that further.

If HCCP pauses or stops, there is a risk that existing Humber emitters will not decarbonize or shut down leading to further UK de-industrialization. New businesses looking to set up in the Humber area may choose to deploy capital elsewhere.

10.3 Why is this approval needed now?

Humber Tranche 1 has been completed as per the APDP; the project is ready to proceed into the next phase of work. There is no funding to continue holding the project team without this approval.

11 Cost and Schedule

Costs for delivery of the Humber Tranche 2 activities are provided in Section 11.1 (2Q25 cost basis) and Section 11.2 (costs adjusted to FY21/22 basis).

The 2024 APDP Humber Tranche 2 is now split into Tranche 2 and Tranche 3. This business case does not request a determination for Tranche 3. NEP anticipates the Tranche 3 devex to be in the order of £37.3 million (early indicative cost to be confirmed in Q1-27)

Section 11.3 covers the Tranche 2 activities (level 2), and Tranche 3 activities to FID (level 1). Section 11.4 provides the integrated view across the NEP Expansion projects to their combined FID. Section 11.5 lists opportunities and risks to the schedule.

11.1 Humber Tranche 2 costs

The cost table below is the first draft 2Q25 Cost basis for Tranche 2.

Description	Tranche 2 “2Q25 Cost” [£m]	Assumptions	Basis
[REDACTED]	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]
[REDACTED]	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]
[REDACTED]	[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED]
[REDACTED] [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED]	[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED]	[REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED]	[REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED]	[REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]

[illegible]

Table 5 Tranche 2 development costs

11.2 Humber Tranche 2 costs (to FY21/22)

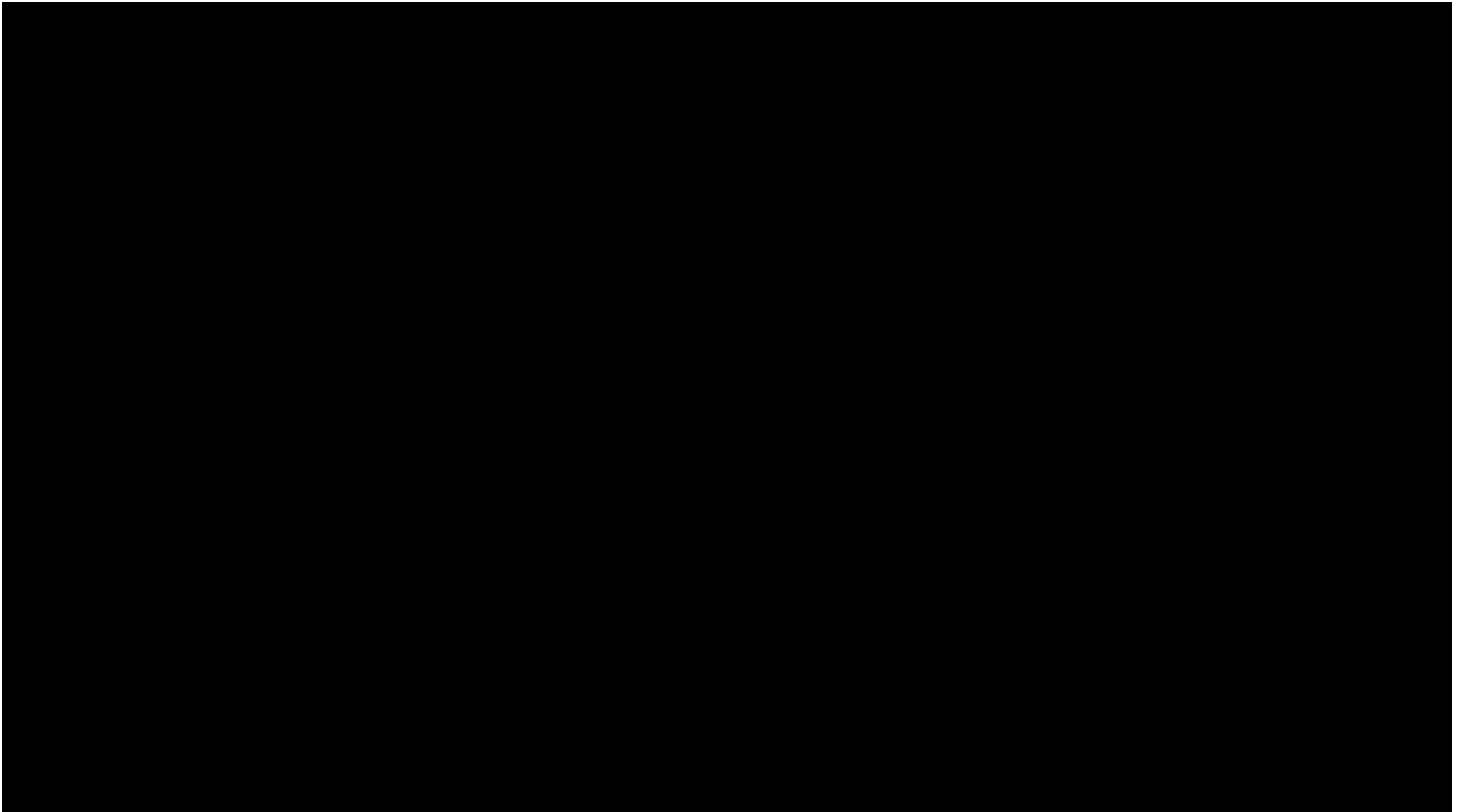
The cost table below shows how the 2Q25 estimate is escalated to Nominal basis and then Deflated to FY21/22 cost basis.

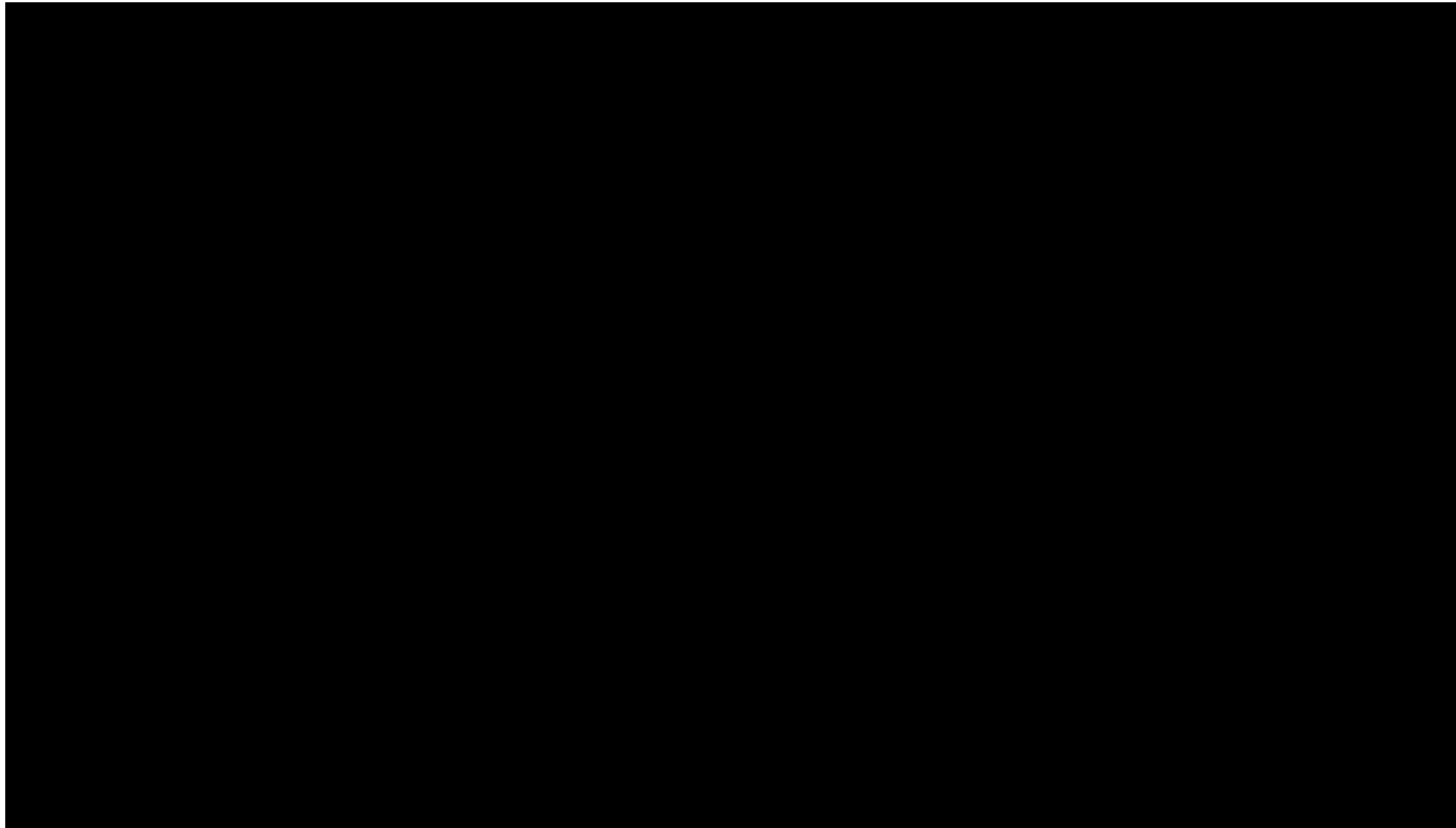
Description	2Q25 Cost [£m]	Escalation (%)	Nominal Cost Estimate (Including escalation) [£m]	Deflation (%)	Deflated Cost FY21/22 [£m]
[REDACTED]					
[REDACTED]					
[REDACTED]					
[REDACTED]					
[REDACTED]					
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[REDACTED]					
TOTAL: Humber Tranche 2	£99.23 million		£103.52 million		£83.36 million

Table 6 2Q25, Nominal and Deflated FY21/22 Cost

11.3

[REDACTED]





11.3.1 Humber Tranche 2 Schedule Assumptions

- Project schedules are developed by bp planning with inputs from the project team under the guidance of the appraisal manager. Existing project knowledge from the NEP Phase 1 Project and internal bp benchmarking information is used.
- The engineering scope includes activities / deliverables to support EIA, DCO submission and examination – such as support during statutory consultation, refinement pipeline routing, construction corridor, AGI & pump station footprint, Preliminary P&IDs, 3D model, civil architectural drawings and preliminary foundation/piling design, preliminary electrical, lighting and CP design, (as discussed above in section 8.2). [REDACTED]
- [REDACTED] is facilitating land access and associated services - scope includes the development of the Head of Terms, Options Agreements, Deeds of Easement, Leases, licences and associated payments, as well as the support and development of the deliverables required to support DCO application (e.g. side agreements, statement of common grounds, memorandum of understanding, book of references, work packs and plans etc.). The agreed Intrusive access has targeted by 2Q2026.
- Ground Investigation surveys support the DCO submission and inform FEED scope. RFP's will be prepared and contracts awarded for Ground Investigation Surveys (overland and overwater) to commence early 2026 and continue until mid-2027, with the completion of the overland geotechnical and overwater geotechnical (bore hole) surveys. These will be competitively bid, and survey timeline will be verified upon selection of the contractor.
- [REDACTED]
[REDACTED] The overall DCO timeline is expected to take circa 4 years with a target to commence statutory consultation in 2025, submission in 2027 and approval in early 2028. DCO & TCPA durations were considered based on the various workshops [REDACTED], in line with NSIPs guideline.
- To minimize the risk of the DCO delaying FID, NEP proposes to continue the DCO work into the next phase of statutory consultation. Following of the DCO submission in 4Q 2026 at the end of Tranche 2, standard examination and review periods would result in a DCO approval in 3Q 2028. This allows for 10 months for possible judicial review prior to the FID in mid-2029.
- Trial HDD: a Town and Country Planning (TCPA) application is required to execute the enhanced ground investigation using the horizontal directional drilling technique (trial HDD). This started in Tranche 1 and will carry into Tranche 2. The current assumption is to award the contract upon Tranche 2 approval, with engineering activities starting in October 2025. The goal is to obtain the necessary data by December 2025 to support the TCPA submission and the start of civil works in Q2 2026. Upon approval by Local Planning Authorities (LPAs) via the TCPA, Civil contractor will commence civil infrastructure works with south first then followed by North. Once this developed HDD contractor will conduct enhanced ground investigation using the horizontal directional drilling technique. This will be conducted from both sides of the river Humber. The durations for the HDD trial are based on the schedule received from the preferred bidder.
- The associated civil works are based on the project estimate, in alignment with a schedule developed alongside a civils contractor schedule.

- The HDD Trial construction durations are aligned with benchmarks established through an exercise that combined bp's existing project knowledge with findings from similar HDD river crossing projects constructed globally.
- The DCO submission, along with the HDD trial report and its outcome in early 2027.
- FEED Market re-engagement will start in early 2026 and contracting activities will commence in 2Q 2026 with a target to complete the evaluation and ready for Award in early 2027. The approval and Award Contract will be at the start of Tranche 3. FEED is planned to take circa 7 months starting 3Q 2027. with a target to substantially complete on time to support EPC contracting activities that will commence in 4Q 2027.

- [REDACTED]. The table below illustrates the indicative timelines for procurement activity relative to the contract's complexity. The current durations in the schedule utilises this basis:

Type	Prepare RFP & Issue (weeks)	Bid Receipt (weeks)	Bid Evaluation (TBE & CBE) (weeks)	Recommendation to Award (weeks)	Approval & Award (weeks)	Total (weeks)	Total (months)
SIMPLE	9	6	3	1	3	22	5.1
AVERAGE	12	7	4	1	3	27	6.3
COMPLEX							
OL GI	18	8	6	1	3	36	8.4
FEED	18	10	8	2	3	41	9.5
EPC	21	12	12	2	3	50	11.6

Figure 14 Contracts RFP to Award Duration

- Award the contract to revalidate survey of the offshore Humber pipeline.
- Prepare and contract for offshore Humber FEED revalidation activities.

The activities in Tranche 2 inform the scope, cost, and schedule of Tranche 3, which will include FEED and EPC contracting ahead of NEP Expansion FID.

11.3.2 Humber Tranche 2 Critical Path

The first critical path runs through:

1. The completion of statutory consultation,
2. Followed by the preparation of the statutory consultation report,
3. This then leads into the DCO preparation and readiness review,
4. Once completed the project will go to decision quality review as well as verification for alignment on reference case (verification).
5. This reference case will form the basis of the DCO submission

The second critical path begins with:

1. Awarding the contract for Civil and HDD Trial,
2. Followed by Civil and HDD Engineering during the preparation, determination, and discharge of the TCPA application,
3. Once discharge completion is finalised, Civils work will commence,

4. Once Civils have been completed on both banks the HDD trial will commence. This will happen on the North and South bank concurrently
5. Completion of the HDD work will inform the decision review alongside the DCO review above. The reference case will be updated, depending on the result of the trial.
6. Upon completion of the decision & cost & schedule verification, the business for the next stage will be updated for submission Ofgem/DESNZ.

FEED procurement data will also form the basis for the Ofgem & DESNZ submission.



11.4.1 Critical Path to Humber FID

Whilst the critical path to an NEP expansion FID is driven by CS006 offshore storage, continued progression of Humber development activities is important. It creates the cost and schedule definition needed by NEP's customers (Humber emitters), and minimizes the risk of potential DCO judicial review impacting FID (as happened on NZT/NEP phase 1).

For Humber, FEED and FEED-revalidation of onshore and offshore Humber scopes are followed by EPC contracting and development of the Class II estimate. Activities informing the Final Investment Decision will be mapped out in more detail in the Tranche 3 business case; these will include verification of readiness for Execute, cost assessment by Ofgem, negotiations between NEP, Ofgem and DESNZ, project financing and securing regulatory permits to proceed.

Not shown on the integrated schedule is the timeline to sanction and start-up of the CO₂ capture projects that will provide the CO₂ for NEP to transport and store. These projects have not been assigned by DESNZ as of mid-2025.

11.4.2 Critical Path to Humber COD

The Commercial Operations Date is different for the sections of HCCP to the North versus the sections to the South of the Humber crossing.

Northern Route handover: June 2032

The Easington pump station programme has been estimated at 36 months from NEP Expansion FID to North Bank H/O in June 2032.

- The critical path to Northern Route handover runs through the completion of FEED validation to allow for key equipment, such as Pumps and Coolers, to be placed on order.
- Delivery of the Pumps allows Mechanical works to start in the Pump House. At the same time the Coolers are equally critical as they have a longer lead time and are phased in later, allowing sufficient time to complete the Mechanical works.
- Electrical / C&I works start during the mechanical works and are then the critical path to be ready to commence Inspection, Testing and Pre-commissioning.
- Pre-Commissioning of the Pump Station would encompass standard testing of each of the systems, utilities, controls, communications etc and hook up with the pipeline control systems, including all hook up and loop testing.
- Following the completion of Pre-Commissioning, System Integration & Commissioning can be conducted for the Northern Route, leading to the H/O date of June 2032.

Southern Route H/O (assuming crossing via tunnel): March 2035

The current basis for the Humber Crossing is based on the Skanska Feeder 9 project, an existing tunnel near the proposed location of the HCCP tunnel.

- The critical path for the tunnel runs through the Consents, Licenses and Discharge of Conditions, prior being able to start any site clearance works on the launch shaft at Goxhill and the Piling Platform at Paull for the reception shaft.
- On completion of the Launch Shaft, the Tunnel Boring Machine (TBM) can be moved into place built and tested ready to begin the Tunnel Boring Works. Work will be

performed 24 hours, 7 days a week. Tunnelling has been estimated to be between 10m to 15m a day, the same as Feeder 9.

- Once the TBM breaks through it will be dismantled and removed and Tunnel Strip out can be performed prior to handing over to the Pipeline Installation Contractor.
- Once the Pipeline Installation Contractor has access to site, there is a period of three months to prepare for the pipeline installation.
- Each pipeline section is then prepared and pushed into the tunnel. Once all the sections are inserted, they drain the Reception Pit to expose the sacrificial Pipe and Pulling Head, cut them and weld the Swanneck Fabrications Cap Ends and CP connection and NDE and Coat. Once done the Tunnel is re flooded to design levels to carry out CP current Drain Testing.
- Then follows the setting up to Fill and Test before Dewatering.
- Finally, it is the Completion Works, leading to the removal of Construction Supports, Winches and Thrusters before finally Demobilising the Insertion equipment, ready for handover to the Systems Integration and Commissioning team.
- There is then just over 7 months for Commissioning the Southern Route and Tunnel, leading to a H/O Date of March 2035.

11.5 Humber Schedule Opportunities and Risks

11.5.1 Opportunities

Key opportunities to bring forward the NEP Expansion FID date include:

- Regulatory Approvals: Proactive engagement with regulatory bodies early to understand requirements and expedite approval periods. This includes but is not limited to:
 - Cost Assessment and Variation Order by Ofgem / DESNZ between tranches, and prior to FID.
 - Offshore OPRED approvals (currently estimated to take fifteen months from submission, which drives the FID date),
 - Offshore NSTA reviews and approval of the store permit,
- Single-sourcing FEL3 engineering (FEED) [REDACTED] and direct award post-Tranche 2. This approach also opens the opportunity to progress additional critical-path FEED scope within Tranche 2 (subject to budget availability), potentially further reducing the Tranche 3 engineering duration.
- Streamlining contracting strategy and accelerating RFP to award timeline, could improve the schedule.

Key opportunities to bring forward the HCCP Onshore handover date include;

- By far the biggest opportunity to impact schedule to COD for South Bank emitters, is if a successful HDD trial gives NEP sufficient and early confidence to change the reference case from a tunnel- to an HDD crossing of the Humber. This opportunity is described in Section 9.2 of this business case. It could improve South Bank H/O by 2 years.

- Early confirmation by DESNZ of emitters would enable optimisation of the Execute schedule, prioritizing spur lines and other key facilities to connect the most important emitters first.
- Deeper involvement of Execute contractors' pre-FID would lead to faster Execute ramp-up. For example: (1) carry out FEED Validation during the EPC Bidding Phase (2) Prepare LLI ITT's during Bidding Phase, ready to place PO's soon after FEED Verification for the Northern Route Linepipe.
- The Execute Stage duration could be optimised by (1) procuring AGI and BV materials earlier (these are currently tied to the end of detailed design engineering). (2) mobilising the AGI Enabling works and construction activities earlier, not seasonal work.

11.5.2 Risks

- The economic license requires all activities in a certain tranche to be completed before the next tranche can start. This means that a delay in any activity, even if not critical to the business decision to continue, would, in theory, result in a delay to the project. NEP and the regulator Ofgem are assessing how to start the next phase of activities, whilst still completing one or more outstanding items from the previous tranche.
- Any change to major project scope decisions already made would result in delays from additional technical work, commercial re-alignment or re-work of permitting such as the DCO. Examples may include the introduction of new emitters outside of the assumed list or a requirement to connect NEP facilities to other CO₂ transportation and storage networks, either onshore or offshore.
- Late selection and confirmation of Humber Emitters from DESNZ and in case of misalignment upon announcement of emitters. NEP will have to recycle Tier 1 and 2 project decisions (e.g. the route and size of the pipeline). The DCO will have to restart, setting back the project schedule significantly.
- Trial HDD could be impacted by; a) Any potential delays in obtaining TCPA (Town & Country planning), b) the schedule does not currently account for the second drilling timeline.
- Permitting onshore projects in the UK, whether via DCO or TCPA, is complex (many stakeholders), and subject to legal challenges.

12 Appendices

A.1 Humber Tranche 2 Split Request

NEP requests that, from the determination of this Business Case forwards, Humber Tranche 2 (as defined in the APDP) is split into “Humber Tranche 2” and “Humber Tranche 3”.

This request is required to ensure the economic, effective and efficient delivery of the Humber Development Activities up to NEP Expansion FID. With reference to the APDP Section 5, NEP’s request can be summarised as follows:

- “Tranche 2 of Humber Development Activities” is split into:
 - “Tranche 2 of Humber Development Activities”
 - “Tranche 3 of Humber Development Activities”

The Development Activities for the Tranche 2 of Humber Development Activities and Tranche 3 of Humber Development Activities are as detailed below.

Schedule of Development Activities		
Serial	Description	Completion Date
Tranche 2 of Humber Development Activities		
1	DCO application, preparation and submission	██████
2	Ground surveys including a horizontal directional drilling trial in relation to the Humber Crossing	██████
3	Decision on Humber Crossing method	██████
4	Supply chain procurement activities, including market engagement, expression of interest and request for proposal ("RFP") preparation for Tranche 3 activities	██████
5	Offshore Humber environmental surveys revalidation	██████
Tranche 3 of Humber Development Activities		
1	FEED (other than FEED activities undertaken in the first and second Tranche of Humber Development Activities)	██████
2	Supply chain procurement activities, including market engagement, expression of interest and request for proposal ("RFP") <i>preparation for Execute</i>	██████
3	Offshore Humber FEED revalidation	██████
4	Management and execution of legal, financial and technical due diligence (and any other related advisory activities) associated with the raising of capital in respect of the Humber Expansion	██████

Table 7 Humber Tranche 2 Development Activities Split

A.2 Proposed Updates to Approved Project Development Plan (APDP)

NEP requests that updates are made to the APDP, in order to maintain consistency with this business case. Section 5.2 (a) to 5.2 (c) should be updated as follows. Additions are in red, deletions are struck through:

Humber Onshore and Offshore Transportation System

- (a) The **"Humber Onshore and Offshore Transportation System"** shall comprise the following systems and sub-systems:
 - (i) Humber Offshore Transportation System; and
 - (ii) Humber Onshore Transportation System.
- (b) The **"Humber Offshore Transportation System"** shall include the following system(s), structure(s) and components:
 - (i) electrically driven centrifugal pump(s) with an indicative capacity of 17.00 MTPA instantaneous and sufficient redundancy to achieve the Availability Target, which are co-located at the site of the gas terminal at Easington; and
 - (ii) 28" nominal pipeline and the associated tie-in spools connecting the Humber Onshore Transportation System at the Humber Pumping System and the Endurance Storage Site.
- (c) The **"Humber Onshore Transportation System"** shall connect to relevant Future Users in the Humber region, shall have an indicative capacity of 17.00 MTPA instantaneous and shall include the following system(s), structure(s) and components:
 - (i) **26" Main Line**
 - (A) **a 26" pipeline with an indicative capacity of 17 MTPA instantaneous (539 kg/s) for dense phase CO₂ located north and south of the River Humber, connecting AGI-1 - Drax Inlet to AGI-6 - Easington Outlet, including crossing of the river Humber (the "Humber Crossing")**
 - ~~(ii) a pipeline crossing at the Humber with an indicative capacity of 15.81 MTPA instantaneous (501.33 kg/s) (the "Humber Crossing");~~
 - ~~(iii) a 26" nominal diameter pipeline from the pig trap installation at the Hedon Interface to a pig trap arrangement on the Humber Pumping System, with an indicative capacity of 17.00 MTPA instantaneous (539.07 kg/s);~~
 - ~~(iv) a 26" nominal diameter pipeline connecting relevant Future Users south of the Humber from a pig trap installation located at the Hedon Interface crossing the Humber in the Humber Crossing to a pig trap installation close to the southern entrance of the Humber Crossing, with an indicative capacity of 15.81 MTPA instantaneous (501.33 kg/s);~~

- ~~(v) a 26" nominal diameter pipeline connecting relevant Future Users south of the Humber, from a pig trap installation close to the southern entrance of the Humber Crossing to an AGI located north west of Keadby, via the north of Scunthorpe, with an indicative capacity of 11.61 MTPA instantaneous (368.15 kg/s);~~
- ~~(vi) a 26" nominal diameter pipeline connecting relevant Future Users south of the Humber, from an AGI located north west of Keadby to a pig trap installation close to Drax, with an indicative capacity of 9.20 MTPA instantaneous (291.73 kg/s);~~
- ~~(vii) two block valve stations one located to the north east of the village of Winterton in the county of Lincolnshire and one located to the south of the village of Withernsea in the East Riding of Yorkshire; and~~
- (ii) **Spur lines**
 - (A) **SP-1:** a 12" nominal diameter spur-line from the pig trap installation at AGI-7 - Keadby Inlet to a pig trap installation at AGI-2 - Keadby Junction, with an indicative capacity of 2.41 MTPA instantaneous (76 kg/s);
 - (B) **SP-2:** a 6" nominal diameter spur-line from the pig trap installation at AGI-8 - Kirmington inlet to a pig trap installation at AGI-3 - Barrow Junction, with an indicative capacity of 0.3 MTPA instantaneous (9.5 kg/s);
 - (C) **SP-3:** a 12" nominal diameter spur-line from the pig trap installation at AGI-9 - Killingholme Inlet to a pig trap installation at AGI-4 - Killingholme Junction, with an indicative capacity of 3.9 MTPA instantaneous (124 kg/s);
 - (D) **SP-4:** an 8" nominal diameter spur-line from the pig trap installation at AGI-10 - Saltend Inlet to a pig trap installation at AGI-5 - Hedon Junction, with an indicative capacity of 1.19 MTPA instantaneous (38 kg/s);
- (iii) **ten AGIs including pigging equipment**, valve isolations, monitoring equipment and instrumentation located:
 - (A) **AGI-1 - Drax inlet:** close to Drax in the county of North Yorkshire;
 - (B) **AGI-2 - Keadby Junction:** at Swinefleet and Reedness Pasture to the south of Goole in the East Riding of Yorkshire;
 - (C) **AGI-3 - Barrow Junction:** near Barrow in the county of Lincolnshire;
 - (D) **AGI-4 - Killingholme Junction:** to the north of Killingholme in the county of Lincolnshire
 - (E) **AGI-5 - Hedon Junction:** to the south of Hedon in the East Riding of Yorkshire;

- (F) **AGI-6 - Easington Outlet:** at the gas terminal at Easington in the East Riding of Yorkshire.
 - (G) AGI-7 - Keadby Inlet: near Keadby in the county of Lincolnshire;
 - (H) AGI-8 - Kirmington Inlet: near Kirmington in the county of Lincolnshire
 - (I) AGI-9 - Killingholme Inlet: near North Killingholme in the county of Lincolnshire;
 - (J) AGI-10 - Saltend Inlet: near Saltend Chemical Park in the East Riding of Yorkshire.
- (iv) **Block Valve Stations (BVS) along the 26" Main Line.**
- (A) **BVS-1 – Goole:** located to the south west of Goole in the East Riding of Yorkshire;
 - (B) **BVS-2 - Winterton:** located to the north east of the village of Winterton in the county of Lincolnshire; and
 - (C) **BVS-3 – Hollym:** located to the south of the village of Hollym in the East Riding of Yorkshire;

A.3 Roll over of ongoing 3rd party contracts

NEP has identified four significant contracts from Tranche 1 and the earlier phase of the project that it recommends rolling over to maintain continuity, support the schedule, promote efficiency and leverage existing knowledge and experience.

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A.4 Variation Notice and HDD Conditional Allowance

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