

OUTLINE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Appendix 11: Outline Dewatering Management Plan (Tracked)

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

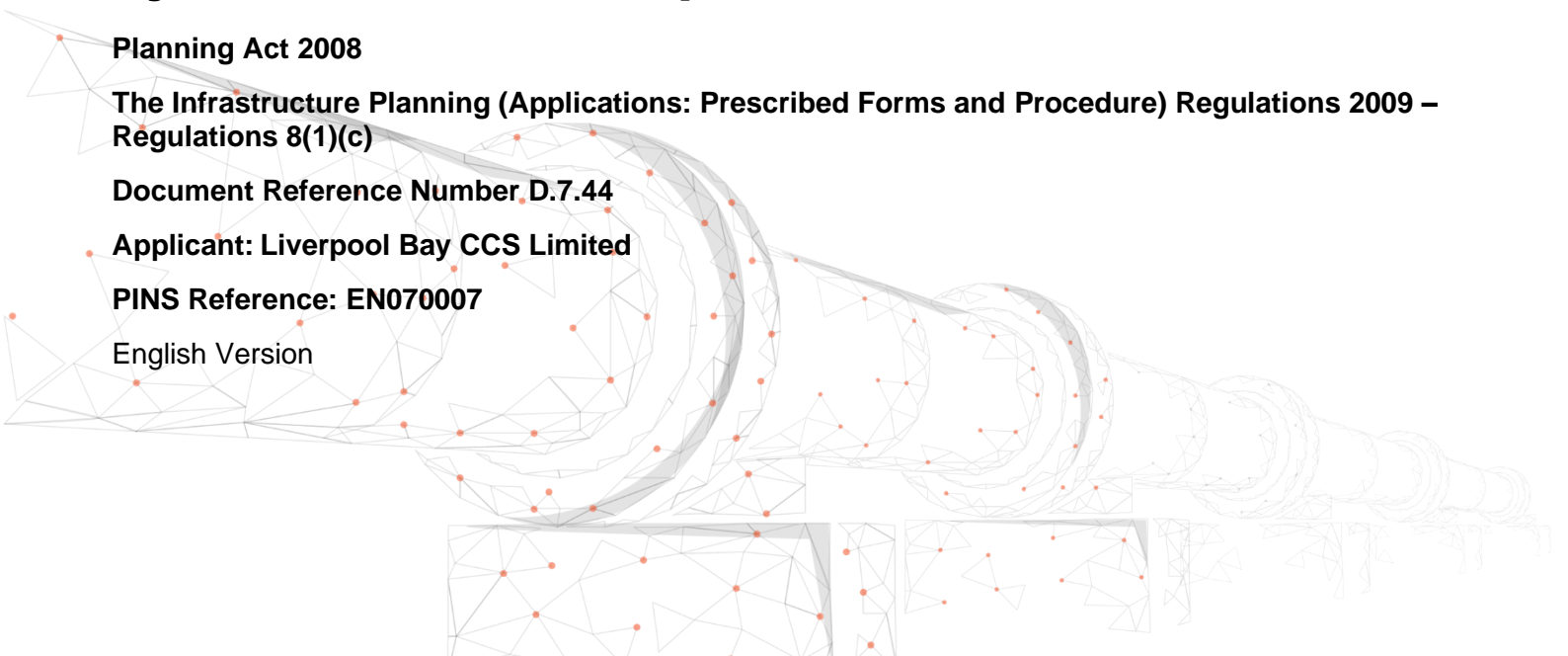
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TABLE OF CONTENTS

- 1. INTRODUCTION 1**
 - 1.1. Project Overview..... 1
 - 1.2. Purpose of the Document 1
 - 1.3. Objectives..... 2
- 2. ROLES AND RESPONSIBILITIES 3**
 - 2.1. Key Roles and Responsibilities..... 3
 - 2.2. Responsible Parties..... 4
- 3. CONCEPTUAL HYDROGEOLOGICAL MODEL 5**
 - 3.1. Information Sources..... 5
 - 3.2. Geological Setting..... 5
 - 3.3. Hydrogeological Setting..... 5
 - 3.4. Hydrological Setting..... 5
 - 3.5. Designated or Sensitive Sites..... 5
 - 3.6. Potential Groundwater Hazards..... 6
 - 3.7. Proposed Construction Activities 6
 - 3.8. Hydrogeological Impact Assessment..... 6
- 4. DEWATERING ACTIVITIES..... 8**
 - 4.1. Dewatering Specific Objectives 8
 - 4.2. Methods of Groundwater Control..... 8
 - 4.3. Water Treatment and Disposal 8
 - 4.4. Programme of Works..... 9
 - 4.5. Mitigation Measures..... 9
- 5. GENERAL ARRANGEMENTS..... 12**
 - 5.1. Overview..... 12
- 6. LICENCES, PERMITS AND CONSENTS 13**
- 7. INSPECTIONS, MONITORING AND MAINTENANCE 14**
 - 7.1. Introduction 14
- 8. GROUNDWATER MONITORING 15**
 - 8.1. Groundwater Monitoring Strategy 15
- 9. STAKEHOLDER ENGAGEMENT 16**
 - 9.1. Communication..... 16
- 10. REFERENCES 17**

TABLES

Table 2.1 - Key Roles and Responsibilities 3

ANNEXURES

ANNEX A – DEWATERING MANAGEMENT REAC COMMITMENTS

1. INTRODUCTION

1.1. PROJECT OVERVIEW

- 1.1.1. This document has been prepared on behalf of Liverpool Bay CCS Limited ('the Applicant') and relates to an application ('the Application') for a Development Consent Order (DCO) that has been submitted to the Secretary of State (SoS) for the Department of Energy Security and Net Zero (DESNZ) under Section 37 of the Planning Act 2008 ('the PA 2008'). The Application relates to the Carbon Dioxide (CO₂) pipeline which constitutes the DCO Proposed Development.
- 1.1.2. The DCO Proposed Development will form part of HyNet North West ('the Project'), which is a hydrogen supply and Carbon Capture and Storage ('CCS') Project. The goal of the Project is to reduce carbon dioxide (CO₂) emissions from industry, homes and transport and support economic growth in the North West of England and North Wales. The wider Project is based on the production of low carbon hydrogen from natural gas. It includes the development of a new hydrogen production plant, pipelines, and the creation of CCS infrastructure. CCS prevents CO₂ entering the atmosphere by capturing it, compressing it and transporting it for safe, permanent storage.
- 1.1.3. The DCO Proposed Development is a critical component of the Project which, by facilitating the transportation of carbon dioxide, enables the rest of the Project to be low carbon. The hydrogen production and CO₂ capture and storage elements of the Project do not form part of the DCO Proposed Development and will be delivered under separate consenting processes.
- 1.1.4. A full description of the DCO Proposed Development is detailed in **Chapter 3 – Description of the DCO Proposed Development [CR3-019]**.

1.2. PURPOSE OF THE DOCUMENT

- 1.2.1. This **Outline Dewatering Management Plan (ODMP)** establishes indicative methods to be adapted in the detailed Dewatering Management Plan(s) (DMP). The DMPs will act as control plans which set out detailed methods to avoid, minimise and mitigate likely environmental effects during the construction stage of the DCO Proposed Development, as reported in the ES and the **Register of Environmental Actions and Commitments (REAC)** (document reference: **D.6.5.1**) submitted with the DCO Application. This ODMP presents the minimum protocols to be followed in implementing these measures in accordance with environmental commitments during the detailed design (that will be delivered by the Construction Contractor(s)), pre-construction and construction stages.
- 1.2.2. Detailed Dewatering Management Plans (site specific) will be produced by the Construction Contractor(s) in accordance with this outline plan and Requirement 5(2) of the draft DCO **[REP4-008]**.

- 1.2.3. This document should be read in conjunction with the **Groundwater Management and Monitoring Plan (GMMP)** (document reference: **D.7.41**).
- 1.2.4. This document outlines the requirements that will be contained within the Detailed Dewatering Management Plan (**D-WR-035** of the **REAC**, document reference: **D.6.5.1**), including:
- the work site and proposed construction activities that will require groundwater control and management;
 - the results of a water features survey within a radius of search appropriate to the hydrogeological setting and anticipated dewatering rates;
 - the conceptual hydrogeological model for the site, from which the dewatering requirements have been developed;
 - the potential groundwater hazards (e.g., known contamination);
 - the hydrogeological impact assessment (HIA);
 - the proposed groundwater control structures (e.g., sheet piling, pumping wells);
 - the site-specific mitigation measures (e.g., water treatment) required to reduce the potential effects arising either directly or indirectly on identified receptors;
 - the main discharge points, abstraction and discharge rates;
 - the inspection, monitoring, and maintenance plan;
 - the licences, permits or consents relevant to the proposed works;
 - the roles and responsibilities of relevant parties;
 - the proposed monitoring (linking back to the Groundwater Management and Monitoring Plan); and
 - other relevant information.

1.3. OBJECTIVES

- 1.3.1. The objective of the Outline Dewatering Management Plan (and subsequent Detailed Dewatering Management Plans) is to provide a framework for managing the risks associated with the proposed dewatering activities (also referred to as 'groundwater control') required for construction of the DCO Proposed Development through appropriate mitigation measures as outlined in the REAC (document reference: **D.6.5.1**).
- 1.3.2. The Detailed Dewatering Management Plans will be sufficiently developed from a technical and regulatory perspective prior to any dewatering activities occurring, to demonstrate compliance with relevant statutory regulatory requirements and other commitments agreed through the DCO process.

2. ROLES AND RESPONSIBILITIES

2.1. KEY ROLES AND RESPONSIBILITIES

- 2.1.1. Where undertaken as part of Temporary Works, the design of groundwater control measures is the responsibility of the Construction Contractor(s) and is often undertaken by a specialist dewatering contractor working on their behalf.
- 2.1.2. The roles and responsibilities for the Detailed Dewatering Management Plans are presented in Table 2.1.

Table 2.1 - Key Roles and Responsibilities

Role	Key Responsibilities
Construction Contractor(s)	<ul style="list-style-type: none">• Develop the design in conjunction with the Dewatering Specialist/Dewatering Sub-contractor and discharge their duties in relation to Construction (Design and Management) Regulations 2015 (Ref 1.1).• Apply for necessary licences, permits and consents and ensure compliance with requirements.• Monitor compliance with Detailed Dewatering Management Plans and associated plans – GMMP (document reference: D.7.41).• Liaise with client, regulators and other stakeholders to communicate the plan and to address concerns and queries.
Dewatering Specialist	<ul style="list-style-type: none">• Assess the nature and extent of dewatering required.• Assess the design requirements to mitigate potential impacts as identified in the Hydrogeological Impact Assessment• Develop the design in conjunction with the Construction Contractor(s) and Dewatering Sub-Contractor having regard to relevant duties in line with the CDM Regulations 2015 (Ref 1.1).

Role	Key Responsibilities
Dewatering Sub-Contractor	<ul style="list-style-type: none"> • Install, operate, and manage the dewatering system. • Inspect, monitor and maintain the dewatering system. • Report on performance of dewatering system. • Optimise performance of dewatering system. • Comply with regulatory requirements. • Decommission the system. • Discharge their duties under CDM2015.

2.2. RESPONSIBLE PARTIES

2.2.1. The names and contact details of the responsible parties will be included in the Detailed Dewatering Management Plans.

3. CONCEPTUAL HYDROGEOLOGICAL MODEL

3.1. INFORMATION SOURCES

3.1.1. The Information Sources used in the development of the conceptual hydrogeological model are as follows:

- British Geological Survey (BGS) GeoIndex online database
- BGS 1:50,000 and or 1:25,000 Geological Map Sheets
- DEFRA Magic Maps
- Ground Investigation data/information

3.2. GEOLOGICAL SETTING

3.2.1. This section will provide a brief description of the superficial and bedrock geology at the location of the proposed dewatering activity.

3.2.2. This will be based, where possible, on site-specific information obtained through targeted ground investigation and supplemented with published, publicly available information including BGS GeoIndex and historic borehole logs.

3.3. HYDROGEOLOGICAL SETTING

3.3.1. This section will provide a description of the hydrogeological regime at the site, including aquifer designations, aquifer vulnerability, groundwater levels, flow direction and groundwater flow rates.

3.3.2. The Construction Contractor(s) should demonstrate a clear understanding of aquifer characteristics using published information and site-specific information based on targeted ground investigation, including where appropriate, pumping test data.

3.3.3. This section will include details of the locations of licensed and unlicensed water supplies, any groundwater source protection zones (SPZs), and details of any consultation held with regulatory authorities and/or licence/permit holders.

3.4. HYDROLOGICAL SETTING

3.4.1. This section will provide a brief description of the hydrological setting including the distance and direction to rivers, streams, drainage ditches, flood zone information, and risk from fluvial and pluvial flooding, and groundwater flooding.

3.5. DESIGNATED OR SENSITIVE SITES

3.5.1. This section will present the details of any groundwater dependent sites within -an appropriate search radius from the proposed dewatering site. The search radius will be defined on a site-specific basis, based on the

conceptual understanding of the hydrogeological conditions at the site and the anticipated dewatering rates 500 m of the site.

3.5.1.3.5.2. Where there are potential risks to receptors from the dewatering activities, these will be considered in the Hydrogeological Impact Assessment (HIA) in Section 3.8.

3.6. POTENTIAL GROUNDWATER HAZARDS

3.6.1. This section will include a description of any known, or reasonably foreseen, potential groundwater hazards at the site.

3.6.2. For example, targeted ground investigation undertaken prior to construction may identify groundwater contamination issues linked either directly to the site or indirectly linked to adjacent off-site sources.

3.6.3. In such circumstances, the potential risks to groundwater will be considered in a separate Groundwater Risk Assessment (GRA), but the DMP should consider the findings of such work in developing a system that will seek to prevent the discharge of hazardous substances and limit the discharge of polluting substances. For example, a treatment system may need to be employed prior to discharge.

3.6.4. Other potential groundwater hazards for consideration include the potential to exacerbate flooding (groundwater or surface water) during high rainfall events or winter months.

3.7. PROPOSED CONSTRUCTION ACTIVITIES

3.7.1. This section will include a description of the construction activities and associated works proposed at the site, including information on temporary compounds, lay-down areas, haul roads, areas of excavation stockpiling, and plant storage/maintenance which may impact upon dewatering or groundwater activities.

3.8. HYDROGEOLOGICAL IMPACT ASSESSMENT

3.8.1. The Construction Contractor will be responsible for undertaking Hydrogeological Impact Assessments (HIA) that considers the potential risks and mitigation associated with dewatering during the construction stage which will be site specific.

3.8.2. The HIAs will be undertaken with reference to the following guidance and the methodologies therein:

- Environment Agency (2007). Hydrogeological impact appraisal for groundwater abstractions. Science Report-SC040020/SR2;
- Environment Agency (2021). Temporary dewatering from excavations to surface water. www.gov.uk.

- 3.8.3. In preparing the HIA, the Construction Contractor will satisfy themselves that the most current and appropriate guidance is followed. For example, Environment Agency (2021) only applies to the short term, temporary discharge of uncontaminated water from an excavation to surface water.
- 3.8.4. The Construction Contractor will refer to relevant permitting/licensing guidance from the EA and NRW for abstractions and discharges (e.g. <https://www.gov.uk>) to ensure that the most current regulatory requirements are being met.
- 3.8.5. The HIA will use the water features survey to identify all potential receptors that may be susceptible to the effects of dewatering (e.g., rivers, ponds, springs, and abstractions). It will describe the likely mechanisms for interaction between groundwater and surface water features, and as appropriate, assess the potential impacts of the proposed dewatering on flows and levels in identified receptors e.g., baseflow contribution to rivers where it is considered there is hydraulic continuity between groundwater and surface water.
- ~~3.8.3~~-3.8.6. The Construction Contractor(s) will provide a summary of the key findings of the HIAs to inform the construction management measures included within the Detailed Dewatering Management Plan.

4. DEWATERING ACTIVITIES

4.1. DEWATERING SPECIFIC OBJECTIVES

- 4.1.1. The objectives of the dewatering scheme to be employed are as follows:
- Prevent an excavation below the water table from flooding;
 - Reduce the potential for drawdown of surrounding groundwater outside the site boundary;
 - Prevent derogation of existing water supplies in proximity of the works; and
 - Prevent derogation of surface water flow (where baseflow is an important component), groundwater dependent habitats / other sensitive designated sites.

4.2. METHODS OF GROUNDWATER CONTROL

- 4.2.1. The principal methods of groundwater control will be detailed below in the Detailed Dewatering Management Plans.
- 4.2.2. The design of the system will be supported by relevant information including any additional site investigation data, including pumping test reports and analysis of drawdown.
- 4.2.3. These will take into consideration the specific constraints of the site; the findings or the HIA: and any specific regulatory requirements.
- 4.2.4. The Construction Contractor(s) will include site-specific details based on the site conditions and their assessment of groundwater conditions. These details will be illustrated by additional reports, suitably scaled drawings and plans for reference.
- 4.2.5. These details will include, but not be limited to the following:
- Physical Cut-Off Methods e.g., sheet piling, diaphragm wall
 - Principal Control Methods e.g., sump pumping, well points, or passive relief wells.
- 4.2.6. Details of the information supporting the design will be included in the Detailed Dewatering Management Plans.

4.3. WATER TREATMENT AND DISPOSAL

- 4.3.1. The Construction Contractor(s) will include details of water treatment requirements including sediment control, containment and or discharge activities.
- 4.3.2. All relevant consents will be sought from the Environment Agency or Natural Resources Wales for temporary discharges and in-stream works affecting Main Rivers (**D-WR-033** of the **REAC, document reference: D.6.5.1**). Temporary discharges will comply with the requirements of

permits/consents on Main Rivers from the Environment Agency or Natural Resources Wales, both regarding acceptable discharge volumes and water quality (**D-BD-054** of the **REAC**, Document reference: **D.6.5.1**).

4.4. PROGRAMME OF WORKS

4.4.1. The Construction Contractor(s) will include a programme of works that demonstrates key milestones, including commissioning, operation and decommissioning of the dewatering works and associated equipment.

4.5. MITIGATION MEASURES

Pollution Prevention

4.5.1. Construction Contractor(s) will refer to the Detailed CEMP for relevant pollution prevention measures and to ensure correct approaches adopted such as the following:

- The Construction Contractor(s) will prepare and implement appropriate measures to control the risk of pollution due to construction activities, materials and extreme weather events (**D-GN-002** of the **REAC**, document reference: **D.6.5.1**).
- The Construction Contractor(s) will be required to investigate and provide a report in the event of a pollution event, including description, type of contaminant, quantity of contaminant, likely receptors, contributory causes, adverse effects and measures implemented to mitigate adverse effects, and recommendations to reduce the risk of reoccurrence. The Construction Contractor will also ensure that environmental incidents in England and Wales are reported to the Environment Agency or Natural Resources Wales' incident hotline at the earliest opportunity. (**D-GN-003** of the **REAC**, document reference: **D.6.5.1**).
- The Construction Contractor(s) will put measures in place to prevent pollution from construction plant, machinery and vehicles including refuelling in designated areas, and ensuring plant is maintained to a good condition. Drip trays will be used during any emergency maintenance and spill kits will be made available on site (**D-WR-012** of the **REAC**, document reference: **D.6.5.1**).
- The Construction Contractor(s) will implement measures to control spillage or pollution risks from site runoff; works within or adjacent to watercourses will be regularly inspected to determine if pollution control measures are working effectively (**D-WR-018** of the **REAC**, document reference: **D.6.5.1**).

4.5.2. Relevant best practice guidance to be followed may include the following:

- Pollution Prevention Guidelines (PPGs) (**Ref 1.3**)– although withdrawn in 2015, these guidance notes provide a sound basis for good operational practice. Examples include:

- PPG1: General guide to pollution prevention;
 - PPG2: Above ground oil storage tanks;
 - PPG5: Works in, near or over watercourses;
 - PPG6: Working at construction or demolition sites;
 - PPG7: Safe operation of refuelling facilities;
 - PPG8: Safe storage and disposal of used oils;
 - PPG13: Vehicle washing and cleaning;
 - PPG18: Managing fire water and major spillages;
 - PPG21: Incident response planning;
 - PPG22: Dealing with spills; and
 - PPG26: Drums and intermediate bulk containers.
- Control of water pollution from construction sites – Guidance for consultants and contractors (CIRIA C532) (**Ref 1.4**); and
 - Environmental Good Practice – Site Guide (Fourth Edition) (CIRIA C741) (**Ref 1.5**).

Erosion and Sediment Control

4.5.3. The Construction Contractor(s) will identify and refer to measures to control erosion and sediment to ensure correct measures are adopted or create bespoke plans depending on any site-specific circumstances such as the following:

- Where practicable, construction works will avoid works on watercourses during high flow events to reduce the risk of fine sediment release (**D-BD-046** of the **REAC**, document reference: **D.6.5.1**);
- Sufficient working areas as agreed by the Construction Contractor(s) will be made available for effective sediment management for works within watercourses (**D-WR-002** of the **REAC**, document reference: **D.6.5.1**);
- Surface water runoff from construction works within 10m of watercourses will be treated by use of a sediment trap where required (**D-WR-005** of the **REAC**, document reference: **D.6.5.1**);
- Temporary drainage systems will be implemented near sensitive receptors to control surface water runoff, to alleviate both flood risk and help to prevent sediment laden runoff entering the watercourse (**D-WR-006** of the **REAC**, document reference: **D.6.5.1**); and
- Silt fences, silt traps, filter bunds, settlement basins and/or proprietary units' will be used to treat sediment laden water generated on-site before discharge (**D-WR-024** of the **REAC**, document reference: **D.6.5.1**)

Enhanced Mitigation (GWDTE)

4.5.4. This section will include details of any enhanced mitigation or operational control procedures where the dewatering activity has the potential to

interact with sensitive receptors e.g., groundwater dependent terrestrial ecosystems (GWTDEs).

4.5.5. Such measures may include, but not be limited to the following:

- a) The provision of discharges to GWTDEs to increase groundwater levels and flows where these have been reduced by dewatering.
- b) The provision of discharges to groundwater fed or feeding surface water bodies to support groundwater level and recharge;
- c) The provision of discharges to groundwater via infiltration to maintain the groundwater level for abstraction;
- d) The abstraction of groundwater to prevent damaging increases in groundwater level and flow;
- e) Monitoring of wells in proximity to the dewatering to enable/identify any additional mitigation methods if needed.

Enhanced Mitigation (Aquatic Ecology)

- The Construction Contractor(s) will refer to the CEMP and the Surface Water Management and Monitoring Plan to ensure correct measures are adopted should a fish rescue be required (**D-BD-061** of the **REAC** document reference: **D.6.5.1**).
- The Construction Contractor(s) will ensure that all necessary consents and environmental permits are obtained from the relevant agency prior to the commencement of dewatering activities (**D-BD-061** of the **REAC** document reference: **D.6.5.1**).
- The Construction Contractor(s) will ensure that an appropriately sized fish screen is fitted on any transfer intake prior to the commencement of dewatering to minimise the risk of fish entrainment (**D-BD-061** of the **REAC** (document reference: **D.6.5.1**). Screen size is based on the baseline fish community for any watercourse and or ditch, and will be determined at the Detailed Design stage by the appointed Construction Contractor(s).

4.5.6. Note that mitigation measures that include the abstraction and/or discharge of groundwater may be subject to permitting/licensing and consultation should be undertaken with the EA or NRW as appropriate.

4.5.6.4.5.7. The above and further REAC (document reference: **D.6.5.1**) entries relative to dewatering can also be found in Annex A.

5. GENERAL ARRANGEMENTS

5.1. OVERVIEW

- 5.1.1. The general arrangements for the dewatering activities will be provided in the following sections in the Detailed Dewatering Management Plans.
- 5.1.2. Details of the groundwater control system including appropriate drawings, specifications, risk assessments and method statements will be included as appendices to the Plan.
- 5.1.3. General arrangements for dewatering activities will include, as a minimum, details of the following:
- Mobilisation;
 - Commissioning;
 - Power supply and standby arrangements;
 - Discharge arrangement;
 - Additional site-specific control measures; and
 - Decommissioning.

6. LICENCES, PERMITS AND CONSENTS

- 6.1.1. Any permits, licences and consents that are required to support the dewatering works, including abstraction and discharges are outlined in the Other Consents and Licences document (document reference: **D.5.2**).
- 6.1.2. The Detailed Dewatering Management Plan will include any measures for obtaining, implementing and complying with the necessary consents required for the DCO Proposed Development in relation to dewatering activities.

7. INSPECTIONS, MONITORING AND MAINTENANCE

7.1. INTRODUCTION

- 7.1.1. This section will provide the inspection, monitoring and maintenance requirements to be included in the Detailed Dewatering Management Plans for the proposed groundwater control system.
- 7.1.2. This will be communicated to the Construction Contractor(s)' Environment Manager to ensure that this is in general accordance with any similar requirements of the Detailed CEMP.
- 7.1.3. The measures should be tailored to meet the site-specific requirements (e.g., scale and duration of proposed works, methods employed, and site sensitivity).
- 7.1.4. The following requirements should be included as a minimum:
- Site Inspection regime
 - Formal Inspections with EA/NRW
 - Audits
 - Performance monitoring of the dewatering system
 - Discharge monitoring requirements
 - Systems maintenance requirements

8. GROUNDWATER MONITORING

8.1. GROUNDWATER MONITORING STRATEGY

- 8.1.1. Groundwater monitoring may be required during the dewatering activities where there is the potential to interact with sensitive receptors, to determine the effects, if any, on groundwater and other sensitive water dependent receptors in proximity to the works.
- 8.1.2. The details of the groundwater monitoring strategy are set out in the Groundwater Management and Monitoring Plan (GMMP) (document reference: **D.7.41**).

9. STAKEHOLDER ENGAGEMENT

9.1. COMMUNICATION

- 9.1.1. Stakeholder communication and engagement will be undertaken regularly throughout the course of the DCO Proposed Development construction period. This will be detailed in the Stakeholder Communications Plan which will be in accordance with the Outline Stakeholder Communications Plan (document reference: **D.7.45**).
- 9.1.2. Technical engagement requirements and emergency/incident management procedures relevant to dewatering operations will be incorporated into the Detailed Dewatering Management Plan.
- 9.1.3. The following regulating authorities and stakeholders will be engaged with during the production of the Detailed Dewatering Management Plans, when in the locality of their assets:
- Environment Agency
 - Natural Resources Wales
 - Canal and River Trust
- 9.1.4. Contact details for the regulating authorities are:
- | | |
|--|---------------|
| • Environment Agency Incident (Hotline) | 0800 80 70 60 |
| • Natural Resources Wales Incident (Hotline) | 0300 065 3000 |
| • Cheshire West and Chester Borough Council | 0300 123 8123 |
| • Flintshire County Council | 01352 703 440 |

10. REFERENCES

- Ref 1.1 – Construction (Design and Management) Regulations (2015). Retrieved from: [Managing health and safety in construction. Construction \(Design and Management\) Regulations 2015. Guidance on regulations L153 \(hse.gov.uk\)](#)
- Ref 1.2 - National Highways Design Manual for Roads and Bridges LA 113 Road Drainage and the Water Environment, (2020). Retrieved from: [d6388f5f-2694-4986-ac46-b17b62c21727 \(standardsforhighways.co.uk\)](#)
- Ref 1.3 - HM Government (2015), Pollution Prevention Guidance (PPG). Retrieved from: [\[Withdrawn\] Pollution prevention guidance \(PPG\) - GOV.UK \(www.gov.uk\)](#)
- Ref 1,4 - Control of water pollution from construction sites – Guidance for consultants and contractors (CIRIA C532) (2001). Retrieved from: [Item Detail \(ciria.org\)](#)
- Ref 1,5 - Environmental Good Practice – Site Guide (Fourth Edition) (CIRIA C741) (2015). Retrieved from: [Item Detail \(ciria.org\)](#)

Annex A

DEWATERING MANAGEMENT REAC COMMITMENTS

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
D-GN-002	The Construction Contractor(s) will prepare and implement appropriate measures to control the risk of pollution due to construction activities, materials and extreme weather events.	To avoid or otherwise minimise the risk of environmental effects due to unexpected pollution incidents	Construction Contractor(s)
D-GN-003	<p>The Construction Contractor(s) will be required to investigate and provide a report to The Applicant in the event a pollution incident does occur, including the following:</p> <ul style="list-style-type: none"> - A description of the pollution incident, including its location, the type and quantity of contaminant and the likely receptor(s); - Contributory causes; - Adverse effects and the measures implemented to mitigate adverse effects; and - Recommendations to reduce the risk of reoccurrence. <p>The Construction Contractor should also ensure that environmental incidents in England and Wales are reported to the Environment Agency or Natural Resources Wales' incident hotline at the earliest opportunity.</p>	To provide record of any unexpected pollution incidents for monitoring and compliance purposes and to inform the development of action plans to avoid or minimise the potential for reoccurrence	Construction Contractor(s)
D-PD-007	For smaller scale de-watering (such as after periods of heavy rainfall), most local de-watering will be by portable sump-pump discharging to ground through suitable de-silting arrangements. Where required, local soil saturation levels will be monitored to prevent water logging adjacent areas.	To reduce the impacts on surface water quality, groundwater and flood risk	Construction Contractor(s)
D-PD-008	Where larger volumes of de-watering are required, portable pumps will be used to abstract the water into mobile de-silting and water treatment systems.	To reduce the impacts on surface water quality, groundwater and flood risk	Construction Contractor(s)
D-WR-002	Construction works will ensure that a sufficient working area, as agreed by the Construction Contractor(s), is made available for effective sediment management for works within watercourses.	To minimise the impacts on surface water quality, groundwater and flood risk.	Construction Contractor(s)

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
D-WR-005	Surface water runoff from construction works within 10m of watercourses will be treated by use of a sediment trap where required.	To minimise the impacts of surface water quality, groundwater and flood risk.	Construction Contractor(s)
D-WR-006	Temporary drainage systems will be implemented near sensitive receptors to control surface water runoff, to alleviate both flood risk and help to prevent sediment laden runoff entering the watercourse.	To minimise the impacts of surface water quality, groundwater and flood risk.	Construction Contractor(s)
D-WR-012	Measures to be put in place to prevent pollution from construction plant, vehicles and machinery including refuelling and lubricating in designated areas, on an impermeable surface, with appropriate cut-off drainage located away from watercourses; plant to be maintained in a good condition with wheel washing in place (avoiding vehicle cleaning near to existing watercourses), all refuelling would be supervised and carried out in a designated area. In the event of plant breakdown, drip trays would be used during any emergency maintenance and spill kits would be available on-site.	To minimise the impacts of surface water quality, groundwater and flood risk.	Construction Contractor(s)
D-WR-018	Measures implemented to control spillage or pollution risks for site runoff or works within watercourses will be regularly inspected to ensure they are working effectively.	To minimise the impacts of surface water quality, groundwater and flood risk.	Construction Contractor(s)
D-WR-021	Surface water run-off and excavation dewatering will be captured and settled out prior to disposal where practicable. The Construction Contractor(s) will ensure that any contaminants are to be suitably removed prior to disposal,	To minimise the impacts of surface water quality, groundwater and flood risk.	Construction Contractor(s)
D-WR-024	Silt fences, silt traps, filter bunds, settlement basins and/or proprietary units' will be used to treat sediment laden water generated on-site before discharge.	To minimise the impacts of surface water quality, groundwater and flood risk.	Construction Contractor(s)
D-WR-026	Works will be undertaken with the relevant sections of BS6031:2009 Code of Practice for Earthworks (British Standards, 2009) with respect to protection of water quality and control of Site drainage including washings, dewatering, abstractions, and surface water.	To minimise the impacts of surface water quality, groundwater and flood risk.	Construction Contractor(s)

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
D-WR-030	Where practicable, construction works will avoid works on watercourses during high flow events to reduce the risk of fine sediment release and minimise the increase to flood risk from dewatering / hydrostatic testing discharges. The Detailed Design construction programme will seek to target the construction activities involving watercourses for the drier summer months to reduce this risk, whilst taking into account the window for construction activities in relation to aquatic ecology and, in particular, the fish migratory season.	To minimise the impacts of surface water quality, groundwater and flood risk.	Construction Contractor(s)
D-WR-035	The Dewatering Management Plan will provide a general framework for assessing the potential risks arising from dewatering. The Dewatering Management Plan will aim to keep the duration of pumping and the rates to a minimum which is achieved by minimising the required dewatering. The Dewatering Management Plan will summarise all licences and permits to abstract and discharge from dewatering works issued by the Environment Agency and/or Natural Resources Wales. In addition to permitting, the Dewatering Management Plan will included detailed description of the main discharge points, abstraction and discharge rates, equipment used and construction sequence, any authorisation and details of any pre-treatment required prior to discharge approved by the Environment Agency and/or Natural Resources Wales. The Dewatering Management Plan will also act as a vehicle for more specific and detailed assessment (as necessary).	To set out the dewatering strategy of groundwater where dewatering activities are proposed, and to ensure all groundwater abstracted through construction is appropriately managed	Construction Contractor(s)
D-WR-036	In areas of shallow groundwater, the use of temporary sheet piles shall be considered as a hydraulic control measures to limit the ingress of water to the pipeline trench and act as mitigation to reduce the groundwater dewatering rate. If implanted sheet piles will then be removed as soon as practicable after their use.	To minimise the impacts of dewatering to groundwater receptors	Construction Contractor(s)

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
D-WR-038	The groundwater abstraction at Croughton Road, Caughall, may be impacted slightly by the proposed dewatering for the entry and exit pits of the trenchless crossing. The overhead power lines are already acting as a constraint on the possible location of the pits situated between the proposed pit locations and the abstraction, meaning that the likelihood of impact is already very low. However, any impact to the abstraction will be sought to be avoided as far as reasonably practicable.	To minimise the risk of impact from dewatering on groundwater receptors	Construction Contractor(s)
D-WR-067	At the GWDTE at the River Gowy, the GWDTE is situated to the south of the NVC vegetation area which the pipeline will not encroach into. As the expected radius of influence from the dewatering does not extend into this area of GWDTE, there is no impact to it anticipated. Regardless, during detailed design, the final alignment will seek to avoid any impact on the GWDTE as far as reasonably practicable. This is expected to be achieved by the final alignment being situated to the north of the NVC vegetation area	To avoid any impact to the GWDTE	Construction Contractor(s)
D-BD-046	Where practicable, construction works will avoid works on watercourses during high flow events to reduce the risk of fine sediment release. The Detailed Design construction programme will seek to target construction activities involving watercourses for the drier summer months to reduce this risk, whilst taking into account the window for construction activities in relation to aquatic ecology and, in particular, fish migratory seasons. The ECoW will assess the need for mitigation and/or permits to facilitate construction to prevent adverse impacts as a result of construction. Only once mitigation and/or permits are in place can works then proceed	To avoid adverse impacts on water quality and aquatic species	Construction Contractor(s)
D-BD-061	During any river dewatering and/or in-channel working, an ecological watching brief and fish rescue plan will be employed. Where areas are required to be temporarily dewatered to facilitate construction activities,	To avoid adverse impacts to protected species and comply with conservation legislation	Construction Contractor(s)

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
	<p>fish will be removed by means of electrofishing under Environment Agency or NRW consent and relocated upstream prior to dewatering. Suitable temporary channels may be implemented to divert water during culvert construction works. Any environmental permit(s) shall be obtained and in place prior to the creation of a temporary dry channel. The construction of a temporary dry channel shall be undertaken in accordance with the mitigation measures contained within the Detailed CEMPs and any other relevant measures prescribed by granted permits from NRW/EA. Works will be subsequently undertaken under ECoW supervision. A pump may be required to divert flows during construction. Where this occurs, the ECoW shall be in attendance and a 2 mm screen fitted on the transfer intake to minimise the risk of fish and eel entrainment.</p>		