

Liverpool Bay CCS Ltd

HYNET CARBON DIOXIDE TRANSPORTATION AND STORAGE PROJECT - OFFSHORE

Environmental Statement

Volume 3, appendix C1: Air Quality Technical Report



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Glossary

Term	Meaning
Effect	The consequence of an impact
Impact	A change that is caused by an action
Project	The HyNet Carbon Dioxide Transportation and Storage Project.
Proposed Development	The offshore components of the Project which are subject of this Environmental Statement, as described in volume 1, chapter 3.

Acronyms and Initialisations

Acronym and Initialisation	Description
AQS	Air Quality Strategy
CCUS	Carbon Capture, Usage and Storage
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
Defra	Department for Environment, Food & Rural Affairs
LDAR	Leak Detection and Repair
NO ₂	Nitrogen Dioxide
O ₃	Ozone
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PM	Particulate Matter
SO ₂	Sulphur Dioxide

Units

Unit	Description
km	kilometre (distance)

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1 AIR QUALITY TECHNICAL REPORT

1.1 Introduction

This Air Quality Technical Report considers the risk of air quality impacts for the offshore components of the HyNet Carbon Dioxide Transportation and Storage Project (hereafter referred to as “the Proposed Development”).

This report begins by setting out the legislative context for the assessment. The method used to assess potential air quality effects has then been described. A conclusion has been drawn on the significance of the air quality effect.

1.2 Legislative Context

The Air Quality Standards Regulations 2010 (Department for Environment, Food & Rural Affairs (Defra), 2010), amended by The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (UK Government, 2020), sets limit values for ambient air concentrations for the main air pollutants: particulate matter (PM₁₀ and PM_{2.5}), nitrogen dioxide (NO₂), sulphur dioxide (SO₂), ozone (O₃), carbon monoxide (CO), lead (Pb), benzene, certain toxic heavy metals (arsenic, cadmium and nickel) and polycyclic aromatic hydrocarbons (PAHs).

These limit values are legally binding on the Secretary of State. The Government and devolved administrations operate various national ambient air quality monitoring networks to measure compliance and develop plans to meet the limit values.

The Environment Act 1995, as amended by the Environment Act 2021, established the requirement for the Government and the devolved administrations to produce a National Air Quality Strategy (AQS) for improving ambient air quality, the first being published in 1997 and having been revised several times since, with the latest published in 2007 (Defra, 2007). The Strategy sets UK air quality standards and objectives for the pollutants in the Air Quality Standards Regulations plus 1,3-butadiene and recognises that action at national, regional, and local level may be needed, depending on the scale and nature of the air quality problem. There is no legal requirement to meet objectives set within the UK AQS except where equivalent limit values are set within the Air Quality Standards Regulations.

1.3 Assessment Methodology

The main source of ambient air pollutants is the combustion of diesel fuel used in the drilling rig power plant during drilling and recompletion of the wells. The main pollutants are NO₂, PM₁₀, PM_{2.5}, SO₂, CO and benzene. The risk of air quality impacts associated with the Proposed Development has been considered qualitatively using a source-pathway-receptor conceptual model.

Air quality guidance advises that the organisation engaged in assessing the overall risks should hold relevant qualifications and/or extensive experience in undertaking air quality assessments. The RPS air quality team members involved at various stages of this assessment have professional affiliations that include Fellow and Member of the Institute of Air Quality Management and Chartered Environmentalist and have the required academic qualifications for these professional bodies. In addition, the Director responsible for authorising all deliverables has over 18 years' experience.

1.4 Risk Assessment

1.4.1 Construction

The current base case for the Proposed Development includes a total of 13 wells. Eight will be CO₂ injector wells (four at Hamilton Main, two at Hamilton North, and two at Lennox). These will be drilled as side-tracks

from existing producer wells. Each side-tracked wellbore will comprise around 15 days for drilling, and 20 days for completion. Two new dedicated monitoring wells, one each at Hamilton North, and Lennox, will also be drilled. This will require 25 days for drilling and 20 days for completion. One additional monitoring well will be a side-track from an existing producer well (at Lennox) and two will be sentinel wells (one at Hamilton North, and one at Lennox). These sentinel wells will be existing wells that will be recompleted for additional reservoir monitoring. The drilling rig required during drilling and recompletion of the wells will be powered by diesel and the combustion of diesel is a source of local air quality pollutants.

In the context of air quality effects, sensitive receptors are locations where members of the public might be regularly exposed and include building façades of residential properties, schools, hospitals, care homes.

The nearest drilling location (at Lennox) is approximately 11 km from the nearest coastline. There are no distances given in air quality guidance beyond which air quality effects from plant are not considered to have an effect. However, Defra's Industrial Emissions Screening Tool referred to in Defra's "*Local Air Quality Management Technical Guidance: LAQM.TG22*" (Defra, 2022) only considers receptors up to 2 km. This provides a useful guide to the maximum distance at which impacts can be expected. Using professional judgment, at 11 km, emissions from the plant used during construction are highly unlikely to affect local air quality onshore.

In relation to emissions from ships, LAQM.TG22 advises local authorities that there is a risk of exceedance of the short-term objectives for NO₂, PM₁₀ and SO₂ where there are 5,000 or more large ship movements per year. In this case, the construction works will generate substantially fewer ship movements, indicating that the risk of an exceedance is very low. Using professional judgment, emissions from ships used during construction are highly unlikely to affect local air quality onshore.

Overall, the risk of impact during construction is negligible and the ambient air quality effect is not considered significant.

1.4.2 Operation and Maintenance

During the operation phase of the Proposed Development, fugitive and venting emissions may take place but every effort will be made to minimise emissions. Fugitive emissions are unintentional leakages of gases or vapours from pressure-containing equipment or facilities and typically would occur at flanges, valves, and other equipment interfaces. During the operation phase, fugitive emissions will be monitored through a Leak Detection and Repair (LDAR) programme as part of the preventive maintenance activities, to avoid or minimise their presence as low as reasonably practicable. Carbon dioxide (CO₂) is not a local air quality pollutant and there are no ambient air quality limit values, standards or objectives set for the protection of human-health. There are no known emissions of ambient air pollutants during operation and maintenance. This is because there are no permanent emission sources, and emissions will be restricted to the occasional visits by maintenance vessels. On that basis, the risk of impact during operation and maintenance is negligible and the ambient air quality effect is not considered significant.

1.4.3 Decommissioning

Existing UK legislation requires that when an offshore carbon capture, usage, and storage (CCUS) site is closed, the installations and injection facilities must be removed when decommissioned. In addition, all other items of equipment, infrastructure and materials that have been installed or drilled are expected to be entirely removed for disposal onshore.

At this stage, no emissions of local air quality pollutants have been identified during decommissioning. The risk of impact during decommissioning can be reasonably assumed to be no worse than the risk during construction. On that basis, the risk of impact during decommissioning is negligible and the ambient air quality effect is not considered significant.

1.5 Summary

The air quality effects during construction, operation, maintenance and decommissioning of the Proposed Development are not considered significant.

1.6 References

Defra (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Volume 2.

Defra (2010) The Air Quality Standards Regulations

Defra (2022) Local Air Quality Management Technical Guidance, 2022 (LAQM.TG22)

UK Government (2020) The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020. Available at: <https://www.legislation.gov.uk/uksi/2020/1313/made> Accessed August 2023.