

LARKSHALL MILL AGGREGATE MANUFACTURING AND CARBON CAPTURE FACILITY

PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

Non-Technical Summary

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DAVID JARVIS ASSOCIATES

CLIENT O.C.O Technology Ltd

PROJECT 2843 Wretham

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1. INTRODUCTION

Overview

- 1.1 This Document is the Non-Technical Summary (NTS) of the Preliminary Environmental Information Report (PEIR) for the proposed O.C.O Technology Aggregate Manufacturing and Carbon Capture Facility at Larkshall Mill, East Wretham, Norfolk. This document provides a summary of the project and the key preliminary findings of the Environmental Impact Assessment (EIA). The Facility is considered to be an 'EIA development' for the purposes of the 'The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017' ('the EIA Regulations').
- 1.2 The purpose of the PEIR is to provide the preliminary environmental information which has been gathered to carry out an assessment of the key likely significant effects of the project, from construction through to decommissioning.
- 1.3 The Facility is a National Significant Infrastructure Project (NSIP) under the Planning Act 2008. This is because it is classed as a hazardous waste facility with a capacity of more than 30,000 tonnes per annum (tpa). Consent for the Facility would therefore require a Development Consent Order (DCO) to be submitted to the Planning Inspectorate, who will determine the application on behalf of the Secretary of State.
- 1.4 The Environmental Statement (ES) which will outline the full EIA for the project, will be informed by stakeholder responses to the PEIR. The ES will accompany the DCO application for development consent and will be submitted to the Planning Inspectorate in late 2022.

Next Steps

- 1.5 The PEIR will be subject to statutory consultation in accordance with Section 42 'Duty to Consult' of the Planning Act 2008 and Regulation 13 of the EIA Regulations. The consultation will start on 4th July 2022 and will close on 12th August 2022. We'd like to hear what you think, so please share any concerns, ideas or local knowledge that you may have.
- 1.6 O.C.O Technology Ltd will further refine the project design and EIA based upon the consultation responses received in relation to the PEIR. The final results of the EIA will be presented in an Environmental Statement and a summary of all the consultation responses received will be presented in a Consultation Report, both of which will accompany the DCO application to be submitted in circa late 2022.

The Applicant

- 1.7 Founded in 2010, O.C.O Technology established its first production facility in 2012, and now operate three sites in the UK; Brandon (Suffolk), Avonmouth (Bristol) and Leeds. The company specialises in Carbon Capture and Utilisation (CCU), waste treatment, and sustainable construction products.
- 1.8 O.C.O. Technology uses an award-winning, patented process known as Accelerated Carbonation Technology (ACT) to manufacture a high-quality lightweight aggregate M-LS (Manufactured LimeStone). The ACT process permanently captures more carbon dioxide (CO2) than is generated during its manufacture, making M-LS the world's first truly commercially produced carbon-negative aggregate.
- 1.9 The manufactured, lightweight and carbon negative aggregate, is sold for use in the construction industry, thus conserving supplies of virgin aggregates which would otherwise be consumed as well as helping to decarbonise the construction industry.

- 1.10 O.C.O Technology is a genuine 'World's First' and has attracted interest from both the UK Government and the international community.
- 1.11 In the period from 1st October 2020 to 30th September 2021:
 - The Company produced 350,384 tonnes of Manufactured LimeStone
 - This diverted some 143,058 tonnes of waste from landfill
 - In total 12,929 tonnes of carbon was captured (verified EPD vale of -36.9kg/tonne as based on BS EN 15804 +A1 – equivalent of 588,000 trees planted (assuming 22kg per tree per year)), or an offset to 6,600,999 car journeys (DoT average car journey of 8.4 miles)
 - Enough aggregate to make 97,000,000 of construction blocks (based on a block weight of 18kg with an M-LS content of 20%)
 - This allowed for 477,976 tonnes of natural limestone to be replaced.

Background to DCO Application

- 1.12 The proposed Larkshall Mill Aggregate Manufacturing and Carbon Capture Facility would use carbon capture technology to manufacture carbon negative aggregate for use in the construction industry.
- 1.13 One of O.C.O Technology's existing sites at Brandon in Suffolk needs to relocate as the lease for that facility is expiring. Therefore, a planning application has been submitted to Norfolk County Council to build the facility at Larkshall Mill under the Town and Country Planning Act 1990 (referred to as the 'TCPA Development application' herein).
- 1.14 This existing application is awaiting a decision but by law Norfolk County Council is only able to grant planning permission for a facility that can process 30,000 tonnes of Air Pollution Control residue (APCr) every year.
- 1.15 To support the growth of the business, O.C.O Technology are making plans for the site to process over 100,000 tonnes of APCr every year. The additional processing of APCr is important to being able to increase the productive capacity of the site.

2. THE APPLICATION SITE

Site Location

2.1 Larkshall Mill is located approximately 5.9 miles northeast of Thetford and around 27.1 miles southwest of the city of Norwich.



Figure 2.1 Site Location (Not to scale)

Site Description

- 2.2 The site is 2.7 hectares (ha) in area which is equivalent of roughly four football pitches. The site was previously a mill before becoming a waste transfer facility which is now surplus to requirements. The site comprises a number of large buildings, office, weighbridge and a large area of concrete previously used for the storage of skips and containers.
- 2.3 Surrounding land uses include a poultry farm to the north, C&D Foods and Abrey Farms to the south. The site is bounded to the east by a large above ground reservoir. Two residential properties, owned by the applicant, are located at the entrance to the site but are not included in this application.

3. **PROJECT DESCRIPTION**

Introduction

3.1 The purpose of the proposed Aggregate Manufacturing and Carbon Capture Facility is to manufacture an aggregate (building material for use in concrete products such as blocks) that is carbon. The product's carbon footprint is less than zero and it absorbs (captures) carbon dioxide (CO₂).

A planning application for a smaller scale facility at Larkshall Mill is currently awaiting determination by Norfolk County Council (NCC). The DCO Development application to which this PEIR relates will allow for an increase in tonnage of waste materials to be used in the process. The following project description includes both the development proposed in the planning application to NCC and the DCO Development.

The Facility

- 3.2 The Facility consists of the reuse of existing buildings on site for the production, storage and loading of carbon-negative aggregates including new silos for the storage of APCr, and binder, new CO2 tank, new aggregate curing conveyor, new aggregate curing bays and external aggregate processing area.
- 3.3 The Facility seeks to reuse existing site infrastructure where possible. With the exception of the buildings listed above, the majority of buildings on site will be retained.
- 3.4 The existing baler shed and offices will be repurposed as the process building which will house two processing lines and associated offices. The existing waste processing hall will be used for aggregate storage. The existing waste reception hall will be used for both aggregate storage and loading.
- 3.5 Existing offices, welfare facilities and car parking for staff will be utilised.
- 3.6 The roofs of the existing waste reception and processing halls are fitted with photovoltaic panels which are proposed to be retained and reconnected.
- 3.7 In addition to the repurposing of the existing buildings, the following new development is proposed:
 - filler feed hopper and conveyor;
 - 14 no. silos measuring 21m in height;
 - 2 no. CO2 tank measuring 13m in height;
 - sand storage building;
 - aggregate processing (dry screening) within a new aggregate processing building at 9m in height;
 - new curing bay building measuring 13.5m in height;
 - covered aggregate curing conveyor from the aggregate process building to the aggregate curing bays with a maximum height of 12m. and
 - rainwater capture for use in the process.





Description of the Operation of the Facility

3.8 The process uses a waste material that is produced in energy from waste facilities called Air Pollution Control residue (APCr). It is delivered to the site using a tanker to prevent dust generation. It is mixed with sand, cement, CO2 and water using a process developed by O.C.O called Accelerated Carbonation Technology (ACT). The mixture is then formed into a material similar in size and shape to gravel called Manufactured Limestone (MLS).



Figure 3.2 Diagram of Process





- 3.9 The APCr material used in the process is classed as a hazardous waste due to a high pH level (alkaline). It is similar to cement powder in its characteristics. Following processing, the APCr is neutralised and the aggregate produced is inert and no longer classified as a waste. Its use in the process prevents disposal of this material to landfill. There is no effluent or waste produced during the process.
- 3.10 Heavy Goods Vehicles (HGVs) entering the site will report to the weighbridge office and follow a clockwise vehicle circulation route around the site to the silos, sand storage building or aggregate storage building before exiting the site via the weighbridge.
- 3.11 5 no. HGV parking spaces are proposed within the site. These are provided for driver welfare and also overnight parking for tanker drivers.

Hours of Operation

3.12 It is proposed to have 24 hours operation 7 days a week based on the following:

Table 3. 1Hours of Operation

Activity	Proposed Hours
Manufacture of aggregate including production, curing	24-hour, 7 days a week including Bank
and moving cured materials into the storage areas.	Holidays.
Delivery of APCr and cement to the facility and loading	24 hours 7 days a week (including Bank
of silos	Holidays).
Export of aggregate	Monday – Saturday: 0600 – 1700
	Sunday and Bank Holidays: no export
Import of sand and CO2	Monday – Saturday: 0600 – 1700
	Sunday and Bank Holidays: no deliveries

- 3.13 The site will work in a 3-shift work pattern with 12 operatives per shift. Shift changes will occur at:
 - Shift 1: 0600 1400
 - Shift 2: 1400 2200
 - Shift 3: 2200 0600
- 3.14 Office administration will consist of up to 12 people and will work a 0700 to 1730 Monday to Saturday pattern.

Employment

3.15 The site will employ a total 36 staff operating the site (shift patterns above) with 12 support staff and administrative staff (48 in total).

Vehicle Movements

- 3.16 The proposed development will generate an average of 104 daily Heavy Goods Vehicle (HGV) movements (52 in, 52 out).
- 3.17 The Heavy Goods Vehicles (HGV) associated with the proposed use are generally articulated lorries. Tankers are used to transport the APCr and cement powders.



Figure 3.4 Typical O.C.O Lorry for transporting APCr

3.18 The inputs required in the process are set out in Table 3.1 below:

Table 3.2	Tonnage – Imports and Exports
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Import	Tonnes per annum	Daily (weekday) Trips	Notes
APCr	100,000	12	Imported using articulated tanker HGV with 25 tonne max. payload.
Sand filler	90,000	11	Imported using articulated bulker HGV with 29 tonne max. payload.
Cement binder	25,000	2	Imported using articulated tanker HGV with 29 tonne max. payload.
CO ₂	5,000	1	Imported using tanker HGV with 20 tonne max. payload.

Export	Tonnes per annum (approximate)		Notes
Aggregate	250,000	27	Exported using 29 tonne max. articulated bulker HGV. HGVs delivering sand/filler often backhaul the finished aggregate. This is normally up to 25% of the sand/filler HGVs.

3.19 This equates to HGV traffic of 52 in and 52 out on an average weekday spread as per the working hours for each operation as set out above.

Staff vehicle movements

3.20 Proposed staff vehicle movements, based on all staff driving to work, are 96 car movements (48 in, 48 out) spread across the working day, as detailed above, operating 3 shifts plus office staff on a normal 'office' working week. Due to the location of the site, opportunities for use of public transport are limited. However, where possible, car sharing between employees will be encouraged.

Drainage

- 3.21 The Facility will utilise the existing drainage infrastructure which has been assessed as adequate in a Flood Risk Assessment (FRA).
- 3.22 In addition, however, rainwater harvesting is proposed with the water being used in the process. An oil interceptor will also be installed to prevent oil reaching the soakaway in the event of a spillage.

Lighting

- 3.23 it is proposed to retain the existing external lighting, replacing it over time with more efficient LED lighting where necessary.
- 3.24 New safety lighting on the conveyor system and silos IS that will comply with appropriate British Standards, minimise sky glow and light spill, and use LED light sources where possible to avoid ultraviolet and infrared output affecting wildlife.
- 3.25 Additional information on the potential effects of lighting on ecology and landscape will be provided in the relevant chapters of the ES.

Construction of the Facility

3.26 The overall construction period is assessed as being no greater than 8 months.

4. ASSESSING ENVIRONMENTAL EFFECTS

Topics Assessed

- 4.1 PEIR Chapters 1 7 provide an introduction to the policy and legislative context, a description of the DCO Site and surrounds, an overview of the Facility, alternatives that were considered during the design process, and the approached to the EIA and consultation.
- 4.2 PEIR Chapters 8 18 are topic-specific chapters and cover the following EIA topics:

Chapter Number	Title
8	Ecology
9	Water Environment
10	Air Quality
11	Landscape and Visual Impact Assessment
12	Noise
13	Transport
14	Socio-Economic Effects
15	Climate Change
16	Major Accidents and Disasters
17	Cumulative and Combined Effects
18	Conclusion/Summary

Table 4.1 PEIR Topics

Terminology Used in the PEIR

- 4.3 To enable comparison between technical topics and to aid understanding of the PEIR findings, standard terms are used wherever possible to describe the relative significance of effects throughout the PEIR (i.e. 'major', 'moderate', 'minor' and 'negligible'). The effects are also described as being adverse or beneficial. Where the quality standards for each technical discipline result in deviations in the standard assessment methodology, these are described in the relevant chapters as applicable.
- 4.4 Typically, effects that are considered to be negligible or minor are judged to be 'not significant', whereas those that are moderate or major are 'significant'. Where the EIA predicts a significant adverse effect on one or more receptors, proposed mitigation measures are identified to avoid or reduce the effect, or to reduce the likelihood of it happening.

5. FINDINGS OF THE PEIR

Introduction

5.1 An assessment of the environmental effects of the Facility during its construction and operation has been completed or is underway for each of the topics identified in Table 4.1. The likely significant environmental effects of the Facility are fully described or the approach to assessing them set out within the PEIR. This section provides a brief summary of the overall findings of the PEIR.

Ecology

- 5.2 As an existing developed site, potential impacts on ecology are limited. A Preliminary Ecological Appraisal (PEA) was undertaken at site and surrounding area to assess the ecological features (wildlife and vegetation) present. The PEA and previous assessments at Larkshall Mill, identified potential bat activity and therefore a number of bat surveys are proposed to be undertaken over the coming months.
- 5.3 The results of these surveys will inform the final ES Ecology Chapter. Mitigation measures will be recommended if required.

Habitat Regulations Assessment

- 5.4 As the site is located in close proximity to the Breckland Special Protection Area (SPA) and/or Brecklands Special Area of Conservation (SAC), the Planning Inspectorate will need to undertake a Habitat Regulations Assessment (HRA) when determining the DCO application.
- 5.5 A HRA Technical Note has been prepared and will be submitted with the DCO application to provide sufficient information to allow a HRA to be undertaken. The Technical Note is included with this PEIR.

Water Environment

<u>Drainage</u>

- 5.6 This assessment considered the potential impacts of the Facility of surface water and flood risk. It was supported by a separate Flood Risk Assessment (FRA), which assesses the flood risk implications of the Facility in detail.
- 5.7 The site is served by an existing drainage system that discharges to an existing lagoon from which the surface water infiltrates into the ground. The entire site is drained this way using mostly gullies connected to a piped network system. Along the north side of the site where the drainage network is quite shallow, kerb drains are used to collect the surface water before discharging to the pipe network.
- 5.8 Between the piped network and the discharge to the lagoon there are spill tanks to capture hydrocarbons and suspended sediments, as well as a sluice gate to shut down the discharge to the lagoon in case of emergency.
- 5.9 Foul drainage flows from the site are treated by two onsite bio-digester tanks. These clean the water and then discharge as grey water into the surface water system for discharge to the lagoon. The site's two welfare facilities are connected to the two bio-digester tanks.
- 5.10 The Facility drainage strategy has not materially changed compared to the previous landuse, that is, collection and infiltration within the boundary of the site. The site has been assessed to be of very low risk to cause environmental impact due to flooding.

Flood Risk

- 5.11 The site is located in Environment Agency (EA) Flood Zone 1. Areas in Flood Zone 1 can be described as 'land having a less than 1 in 1,000 annual probability of river or sea flooding'.
- 5.12 The Facility is considered at very low risk of flooding, and therefore the requirement for mitigation is negated.
- 5.13 The development receives rainfall over its footprint, collects it though a mostly piped network and discharges to an onsite infiltration lagoon. The existing lagoon is designed to receive the current day levels of rainfall discharge, and that of future climate change predictions of increased rainfall intensity.
- 5.14 To mitigate the risk of the sediment traps filling, and fine material bypassing them and clogging the infiltration bed, their maintenance shall be part of the site environmental management standard operating procedures.

<u>Hydrology</u>

- 5.15 Water used in the process will be supplied via the mains supply. No abstraction is proposed. The process does not result in any effluent.
- 5.16 The Water Environment ES Chapter will include a hydrological assessment undertaken by a suitably qualified hydrologist.
- 5.17 The hydrological assessment will set out the baseline conditions of the water environment at the site. The ways in which the proposal may potentially impact upon the baseline conditions of the water- environment will be identified. A hydrogeological conceptual model will be developed, based on any previous assessments and publicly available data. This will be used to assess potential impacts on the water environment of the proposals including rainwater harvesting. Mitigation measures will be proposed, where appropriate. This assessment work is currently in progress.

Air Quality

5.18 The Air Quality chapter assesses emissions from vehicle movements which have the potential to impact local air quality. The chapter also assesses the dust emissions which may arise from the process.

<u>Air Quality</u>

- 5.19 The assessment uses software to assess the air quality impacts arising from vehicle movements associated with the proposed development at both residential properties and environmentally sensitive locations such as the Brecklands Special Protection Area (SPA).
- 5.20 The assessment of the impact of emissions on both residential receptors and designated ecological sites adjacent to the affected road network finds that there is no likely significant effect.

Dust

5.21 The dust assessment found the risk of significant effects on amenity to be negligible since the greater part of materials processed will be enclosed within buildings. Materials are delivered to site via enclosed tankers or HGVs with tarpaulins covering the material. All HGVs leaving the site with the carbon-negative aggregate must have their loads covered with tarpaulin sheets to prevent dust.

Landscape and Visual Impact Assessment

5.22 The Landscape and Visual Impact Assessment (LVIA) chapter assesses the potential landscape and visual effects arising from the Facility.

- 5.23 The site forms part of a wider area of an industrial estate which is enclosed to the north by a belt of deciduous woodland, to the east by embankments associated with reservoirs, to the south by woodland and to the west good quality hedgerows and hedgerow trees. The site is located in National Landscape Character 86 "The Brecks", District Landscape Area D "The Brecks Heathland with Plantation" District Landscape Character Area and the "Stanta Heath" District Landscape Character Type. The site does not contain any statutory or non-statutory landscape, cultural heritage or nature conservation assets by designation.
- 5.24 The repurposing of the existing buildings on the site and the additional structures which form the proposals would, overall, present negligible adverse landscape effects on the site and either a negligible adverse or negligible neutral effect on landscape features within the site as the site is already in industrial use. There would be an overall negligible effect on landscape value of the surrounding landscape resulting from the proposals as the site is separated from its context by trees and buildings which are located in the remainder of the industrial estate.
- 5.25 Field work has established that there would be either a negligible effect or no effect on visual amenity from the surrounding Public Rights of Way network (including the promoted Peddars Way and North Norfolk long-distance footpath) as there is very limited visibility of the site from the surrounding receptors due to intervening woodland, reservoir embankments and buildings.

Noise

- 5.26 A noise assessment was undertaken to assess the likely significance of noise effects to arise from the operation of the Facility.
- 5.27 Noise emissions from the proposed development are expected to meet the Breckland Council requirements, except for during night-time periods where moderate significant effects may be experienced when APCr tankers access the site during night-time periods. I noted that up to 2 APCr tankers are predicted to access the site during night-time periods.
- 5.28 However, the night-time noise climate at the locality is dominated by noise emissions from the adjacent existing industrial uses. Therefore, night-time noise emissions from the Facility would not be deemed to be out of context with the existing noise levels.

Transport

- 5.29 The Facility will generate an average of 104 Heavy Goods Vehicles daily movements (52 in, 52 out) and 80 car movements 40in, 40 out) over three shifts. This is considered to be less than that previously experienced at site when it was operating as a materials recovery facility.
- 5.30 Baseline levels of road traffic have been calculated for key links on the local road network for the assessment years of 2023 representing the intended opening year. It has been found that the effects from the proportional increase in traffic on all local road links will be negligible.
- 5.31 The impacts on the key links in the road network without mitigation have been considered as:
 - Site access Negligible
 - A1075 Thetford Road, north of the site access Negligible
 - A1075 Thetford Road, south of the site access Negligible
 - A11 east of the junction with A1075 Thetford Road Negligible
 - A11 west of the junction with A1075 Thetford Road Negligible

- A1075 Thetford Road south of the A11 Negligible
- 5.32 Proposed mitigation measures include a management of truck movements, information provided to hauliers and truck movements distributed across the day in order to avoid peak periods for general traffic.
- 5.33 The residual and the cumulative impacts of the traffic associated with the development are both considered to be negligible.

Socio-Economic Effects

- 5.34 The Facility will ensure the continued supply of carbon-negative aggregates in the area following the closure of the Applicant's Brandon facility. It will also ensure that jobs are retained in the area and, in addition, create a number of new jobs in a rapidly advancing sector.
- 5.35 Local suppliers will benefit from the Facility during both the construction and operational phases.

Climate Change

- 5.36 The Climate Change chapter sets out the impact of the Facility on climate with reference to Green House Gas (GHG) emissions and the vulnerability of the Facility to the effect of climate change.
- 5.37 It has been concluded that there will be a net carbon benefit (and as such a positive effect in reducing carbon emissions) of the Facility's operation, compared to the baseline scenario. This Facility supports the UK's trajectory to net zero by 2050 and as such is described as a significant beneficial impact.
- 5.38 The projected effects of climate change over the lifetime of the Facility have been assessed. The Facility has been considered to be appropriately designed and constructed to adapt to impacts arising from climate change and it has been concluded that climate change impacts will have a negligible to slight effect, and as such, there will be no significant adverse effects due to the effects of climate change.
- 5.39 In conclusion, the Facility has been considered to be resilient to the effects of climate change such that any climatic impacts on the Facility have not been considered to be significant, and the Facility will provide a reduction in GHG emissions, which supports the UK's trajectory to net zero by 2050 and as such is described as a significant beneficial impact.

Major Accidents and Disasters

5.40 An assessment of potential risks which could potentially give rise to a major accident or disaster has been undertaken. Risks assessed include fire, flooding, spillages and vandalism. The assessment concludes that risks have been reduced to as low as reasonably practicable once mitigation measures have been implemented.

Cumulative and Combined Effects

- 5.41 An in-combination effect can occur when a single receptor or resource is impacted by a number of environmental impacts (e.g. a residential property is affected by both noise and air quality impacts).
- 5.42 Although an individual development may not itself have significant environmental effects, when combined with other development(s), the impacts could potentially combine to result in a significant cumulative effect.
- 5.43 An assessment of both in-combination and cumulative effects with other developments in the area is currently being undertaken and the findings will be reported in the final Environmental Statement.

6. SUMMARY AND CONCLUSIONS

- 6.1 The PEIR explains the interim findings of the EIA process that has been undertaken for the Facility.
- 6.2 A number of environmental impact avoidance, design and mitigation measures have been identified to mitigate and control environmental effects during construction, operation (including maintenance) and decommissioning of the Facility. It is proposed that these will be secured through appropriate requirements and other controls within the DCO for the Facility, should this be granted.
- 6.3 Feedback from the formal consultation process will be taken into account when preparing the DCO application and in undertaking the EIA process. The ES will present the final findings and conclusions associated with the EIA process, based on the proposed layout and design.