PROPOSED ANAEROBIC DIGESTION FACILITY AT SPRING GROVE FARM, WITHERSFIELD, NORTHWEST OF HAVERHILL, CB9 7SW

Non-Technical Summary

Prepared for: Acorn Bioenergy Limited

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1.0 Introduction

Acorn Bioenergy Limited (Acorn) is applying to Suffolk County Council for planning permission to construct and operate an anaerobic digestion facility and ancillary infrastructure (including digestate pipeline and offsite digestate lagoon near Skippers Lane) at Spring Grove Farm Withersfield, north west of Haverhill, CB9 7SW.

The purpose of this Non-Technical Summary (NTS) is to present, in non-technical language, the results of the Environmental Impact Assessment (EIA) which has been undertaken to accompany the planning application.

The full results of the EIA have been reported in the Environmental Statement (ES). The following sections of this NTS summarise the issues considered by the EIA, the potential impacts of the proposed development and the way in which any impacts could be mitigated and/or compensated for.

1.1 Summary of the Proposed Development

The application proposal (the Proposed Development) is as follows:

> *"The construction and operation of an anaerobic digestion facility and ancillary infrastructure including digestate pipeline and offsite digestate lagoon at Spring Grove Farm, Withersfield"*.

The Proposed Development would import and treat in the region of 92,000 tonnes of feedstock per annum from the landowner's landholding and local farms, which would undergo a process of controlled decomposition (anaerobic digestion) within the Anaerobic Digestion (AD) facility. This anaerobic digestion generates biogas, which is upgraded on site into biomethane, before being removed by tanker to a central facility for injection into the national grid. The AD facility would have the capacity to produce approximately 9,773,133Nm^3 of biomethane per annum.

The feedstock would typically comprise the following:

- silage (rye, oat, maize and grass);
- straw;
- poultry litter; and
- farmyard manure.

In addition to the biogas, the AD process also produces a nutrient rich solid fertiliser and soil conditioner and a liquid fertiliser (digestate), which would be used on local farms in place of raw manures and artificial fertilisers.

The AD process would also result in the production of carbon dioxide (CO_2) as a natural by-product. This by-product is usually vented by AD plant operators, for whom the main goal is the production of biomethane. However, as CO_2 is a precious resource, the proposed AD plant would be fitted with equipment to upgrade the CO_2 to 99.9% purity, suitable for almost all industrial and commercial applications in the UK. Upgraded CO_2 would be liquefied and transported by road to end users within the market area. The proposed AD facility would capture approximately 13,515 tonnes of CO_2 a year.

2.0 Site and Surroundings

2.1 Application Site

The Proposed Development would be located on land to the north of Spring Grove Farm, Withersfield, approximately 2km north-west of the Haverhill town centre, at National Grid Reference TL 63984 46977. The Site is located within the administrative boundary of Suffolk County Council.

The application site comprises two adjoining arable fields, approximately 9.3ha of which at Bowsey Field to the west and approximately 3.2ha Spring Grove Field to the east, totalling approximately 12.5ha, where the main AD facility will be located. In addition to this, a buried pipeline of approximately 3,055m would connect the main AD facility to an offsite lagoon area of approximately 1.5ha. Overall, Bowsey Field would be the primary area assigned to the proposed development with a marginal overlap into Spring Grove to accommodate some of the lower-level infrastructure. The full application site totals 16.2ha.

Access and egress to the main AD facility would be achieved from the A1307 Cambridge Road. The A1307 Cambridge Road connects Haverhill in the east to Linton in the west (c.7km). The offsite lagoon will be accessed via existing farm tracks.

Bounded by established trees and hedgerows of varying density to the north and west, the two main fields are bordered with an additional tree belt of substantial depth extending along the southern boundary (approximate depth of between 75m-122m). The Stour Brook runs west to east along the southern boundary of the site and is flanked by a broadleaved woodland/riparian corridor with adjoining tree belt. The site effectively lies on the southwest facing slopes of a small valley edged by the Stour Brook which eventually feeds into the River Stour. Bowsey field and Spring Grove field are shown to be Grade 2 agricultural land on Natural England mapping.

The area surrounding the Proposed Development is primarily rural agricultural land, with isolated commercial and residential properties. The village of Withersfield lies approximately 900m to the north east of the main AD facility. Hanchet End, a more densely populated residential area, is located at a distance of approximately 500m to the southeast of the Proposed Development.

The nearest human (commercial/business) receptor, The Epicentre at Haverhill, is located approximately 245m south east of the main AD facility. The closest residential receptors (within approximately 400m) include four properties on the A1307 at approximately 325m south west; 330m south east; 390m south west; and 405m west of the proposed site.

2.2 Surrounding Area

The wider area forms an expansive complex of agricultural estate land interspersed with woodland copse and scattered hamlets. It is noted that the site lies adjacent to the Cambridgeshire administrative boundary.

The closest residential property is Spring Grove Farm and associated outbuildings c.80m to the south of the main red line boundary. These buildings fall within the applicant's lease area and is subsequently not considered to be residential receptors for the purposes of environmental assessment. Residential receptors to the west are at approximate distances of 320m, 400m and 406m. To the east, residential receptors are present from approximately 600m from site boundary. To the north the nearest residential receptors are located on Silver Street approximately 650m from the site boundary.

Landscape Designations

The site is not located within or within 2km of an Area of Outstanding Natural Beauty or National Park. The Landscape Character Typology of the Site and surrounds is described as No23. Rolling Estate Farmlands and/or No.24 Undulating Estate Farmlands in the Rural Vision Policy 1 for West Suffolk Council.

There are six areas of ancient woodland within a 2km radius of the Site. Howe Wood lies circa 0.3km to the north east of the AD Plant site, to the east of the PRoW linking Haverhill with Withersfield. Hare Wood, Over Wood, Lawn Wood, Littley Wood and Cadge's Wood all are located to the north west of the main AD site, at in excess of 1km from the Site boundary. The pipeline routeing would pass between ancient woodland blocks of Howe Wood, Lawn Wood and Littley Wood, with at least 150 m standoffs to each, before passing Cadge's Wood adjacent to the offsite lagoons. There are no TPOs within or edging the Site.

Archaeological Designations and Listed Buildings

There are no scheduled monuments, World Heritage Sites or Registered Parks and Gardens located within the application boundary or within the 1km Study Area.

A review of Historic England datasets returned 13 Grade II Listed Buildings and Withersfield Conservation Area within 1km seen in Table 1 below.

Table 1 – Listed Buildings and Conservation Area

Number	Name	Designation
NHLE reference 1236073	Little Thatch	Grade II Listed Building
NHLE reference 1236072	The Grange	Grade II Listed Building
NHLE reference 1236071	13,14 and 14A, Church Street	Grade II Listed Building
NHLE reference 1236070	Elm Lea	Grade II Listed Building
NHLE reference 1375499	Hanchet End Farmhouse	Grade II Listed Building
NHLE reference 1375498	Hanchet End Cottage	Grade II Listed Building
NHLE reference 1331011	Limberhurst Thatch	Grade II Listed Building
NHLE reference 1264841	Turnpike House	Grade II Listed Building
NHLE reference 1264778	Four Cottages Immediately West of Little Thatch	Grade II Listed Building
NHLE reference 1264776	Long Cottage	Grade II Listed Building
NHLE reference 1264777	Church Farmhouse	Grade II Listed Building
NHLE reference 1236109	Silver Street Farmhouse	Grade II Listed Building
NHLE reference 1236074	White Horse Inn	Grade II Listed Building

[1] West Suffolk Local Plan-Rural Vision (2015)

Number	Name	Designation
n/a	Withersfield Conservation Area	Conservation Area

Ecological Designations

One statutory designated site was noted within 2km of the Site – Over and Lawn Woods Site of Special Scientific Interest (SSSI) located 1km to the north of the AD facility.

The data search identified a further 6 non-statutory designated sites within 2km. These sites have been designated as County Wildlife Sites (CWS), many of which comprise Ancient Woodland (AW). The non-designated sites within 2km include Howe Wood CWS (310m north east); Haverhill Flood Park CWS (426m east); Markhams Wood CSW and AW (665m south); Chimswell Ditch CWS (746m south); Hare Wood CWS and AW (1529m north west); and Littley Wood CWS and AW (1820m north).

3.0 Design Considerations

The application site has been identified as occupying a suitable and sustainable location for the development of an AD facility and associated infrastructure, close to the primary sources of feedstock and well located for access to the A1307 Cambridge Road and the wider road network surrounding Haverhill and south-east Cambridgeshire. The site design includes for highway modifications to the existing Spring Grove Farm access onto the adjoining A1307 Cambridge Road.

The Proposed Development would also be served by a pipeline that would carry liquid digestate from the AD facility to the on-farm storage lagoon, where it would be used directly by the farmer for spreading on fields. The installation of the pipeline would reduce traffic movements on local roads.

Detailed technical assessments have been compiled to inform the design of the Proposed Development and recommendations for mitigating any identified potential constraints have been provided, informed by consultation guidance from the Council, where this was available.

Advanced survey, assessment and specialist reporting has also been progressed where constraints have required further clarification, i.e., a geophysical survey to inform the proposed site layout.

3.1 Design Principles

The layout and design of the Proposed Development was considered as part of an iterative design process aimed at reducing the potential environmental effects of the proposed development whilst accommodating operational and commercial requirements.

The findings of the technical and environmental studies undertaken for the planning application were used to inform the design of the Proposed Development, and hence achieve a 'best fit' within the environment of the Site.

Embedded Mitigation

Considerable effort has been made to produce a site layout which achieves the most satisfactory relationship with the landscape of the Site whilst respecting other environmental and technical considerations. During the EIA Screening process, the multi-disciplinary team met on a number of occasions to discuss the various issues which were identified as part of the initial constraints screening process.

The team identified the optimal locations for each type of infrastructure component, i.e., electrical, CHP, tall storage tanks, inert rainwater lagoons, satellite digestate lagoons, pipeline routing. Other embedded mitigation measures include selection of suitable colours for the larger items of plant, use of trenchless construction techniques to avoid features such as hedges and roads, and adoption of good construction and operational management practices. Mitigation of any potential adverse effects was incorporated through the iterative design process.

Changes made as a consequence of this design process, e.g., application of tree root protection zones and landscaping, vegetative screening; access design and access improvements to the A1307 Cambridge Road and technical consideration of potential impacts on residential properties (i.e., air quality and noise) are considered to be embedded mitigation.

Operational Hours

The AD process involves a biological process that is continuous. The processing plant would therefore be operational 24/7. The facility would be staffed during the hours of 07:00 – 19:00 Monday to Sunday, except during peak harvest periods when working hours would be extended as necessary. A supervisory control and data acquisition (SCADA) system would monitor the facility overnight when it is not manned.

In terms of the biomethane, the facility would benefit from approximately 6-7 hours of storage capacity for produced gas; gas export and collection would therefore take place approximately twice during each 24-hour period including once or twice overnight, this would be the main activity requiring night-time lighting.

Deliveries of crops to site would be determined by the harvest. Harvests are ordinarily completed on a campaign basis therefore during the peak harvest periods delivery hours would be in line with standard agricultural harvest-time activity.

Vehicle movements relating to delivery of agricultural by-products and export of digestate would generally be limited to the following hours:

- Monday – Friday 07:00 – 18:00; and
- Saturday 07:00 – 13:00

Vehicle movements would comprise tractors with trailers and various HGVs including tube trailers, in the form of maximum-sized articulated lorries.

3.2 Employment

The facility would be staffed by up to five full time equivalent (FTE) members of staff on-site.

The construction of the AD facility would generate approximately 100 FTE jobs. The temporary increase in employment and the associated secondary economic effects such as supply chain multiplier effects, and spend on local services, would have positive effects at a local level during the construction phase.

3.3 Access

3.3.1 Vehicle Movements and Vehicular Access

The vehicular access to the AD facility would be via the existing Spring Grove Farm entrance off of the A1307 to the south. The access from the A1307 into the farm grounds would be upgraded to ensure it meets requirements for HGV vehicles, with improvements including hard surfacing, construction of a bell mouth and the required visibility splay. A 7m wide, hard surfaced access road would be created from the site access junction to the main site.

In the interests of highway safety and operation, the proposed site access has been designed to allow an HGV to gain access whilst an HGV awaits egress. This would avoid queuing and any subsequent backing up on the adjoining A1307.

In order to minimise HGV movements, the Proposed Development would also be served by a pipeline that would carry liquid digestate from the AD facility to the on-farm storage lagoon, where it would be used directly by the farmer for spreading on fields. The installation of the pipeline would reduce traffic movements on local roads.

3.3.2 Parking

Parking spaces and manoeuvring space have been carefully considered to ensure that no HGVs would need to queue to get into the site. In addition, six car parking spaces are proposed.

4.0 Environmental Considerations

The potential environmental impacts of the proposed AD facility have been assessed through a range of technical assessments, which are provided in full as accompanying technical reports within the ES.

A summary of the scope and findings of the technical chapters are set out below.

4.1 Air Quality

An Air Quality Assessment (AQA) was undertaken along with an Ammonia Emissions Assessment for the Proposed Development.

Neither the Site nor the surrounding area are covered by an Air Quality Management Area (AQMA). A pipeline would connect the AD facility and the storage lagoon, facilitating the transfer of liquid digestate. It should be noted that the pipeline has been assessed in isolation within a separate AQA.

There are a number of ecological sites in proximity to the Proposed Development, namely the Howe Wood, Markhams Wood, Hare Wood, Littley Wood and Over and Lawn Wood Ancient Woodlands. The Over and Lawn Wood is also designated as a Site of Special Scientific Interest (SSSI). Cadge's Wood, North Wood, New Plantation and Leys Wood are noted to be in closer proximity of the digestate lagoon (near Stour Brook).

The area surrounding the Proposed Development is primarily rural agricultural land, with isolated commercial and residential properties. Hanchet End, a more densely populated residential area, is located at a distance of approximately 500m to the southeast of the Proposed Development.

The AQA assessed the potential impacts on air quality and local amenity associated with the Proposed Development. The potential impact associated with odour, dust, road traffic, bioaerosols, ammonia and CHP combustion emissions on both human and ecological receptors has been assessed.

The construction phase assessment has concluded that the construction of the Proposed Development would result in a 'not significant' risk of impacts.

The operational phase assessment has concluded that the Proposed Development would result in a 'not significant' effect at human receptor locations with regard to odour, dust, ammonia, CHP and traffic emissions bioaerosols emissions screen out of the need for further assessment according to EA guidelines. With regard to ecological receptors the process emissions are considered to cause 'no likely damage' to the Over and Lawn Woods SSSI and 'no significant pollution' at the surrounding Ancient Woodlands.

4.2 Archaeology and Cultural Heritage

An Archaeology and Heritage Desk Based Assessment (DBA) was undertaken to understand the potential impact of the Proposed Development on known and potential archaeological remains within the site and heritage assets within and around the site (including the pipeline and offsite digestate lagoon components).

Archaeological potential for the site is generally limited, with the exception of the possible presence of Worsted Street, which may be located along the northern boundary of the site or its vicinity. The effect to all known and potential buried archaeological remains due to the proposed development is considered to be to be Not Significant in terms of EIA. It is expected that any mitigation required for direct impacts could be undertaken as a condition to consent, most likely further investigation of possible features, and the recording of any archaeological remains (should they be present).

Screening has already been proposed as part of the design for the proposed development, and this will contribute to minimising any possible effect on heritage. No additional mitigation is proposed in consideration to indirect effects. No cumulative effects have been identified.

4.3 Ecology

A 2km radius from the site has been used to identify those sites that have the potential to be subject to direct or indirect effects from changes associated with the Proposed Development. Within this distance there are two statutory designated sites present, Over and Lawn Woods Site of Special Scientific Interest (SSSI) located 300m west of the pipeline and Haverhill Railway Walks Local Nature Reserve (LNR) located 600m east of the AD plant site. The Proposed Development is also within a 2km radius of seven County Wildlife Sites (LWS) (of which five are also designated as Ancient Woodland (AW)). The site sits within the impact risk zone of Over and Lawn Woods SSSI.

A 15km radius from the Site has been used to identify those sites that have the potential to require assessment under the Habitats Regulations. There are no European sites within this distance.

The ecological receptors that have been identified comprise designated sites (Over and Lawn Woods SSSI), Ancient Woodland; habitats of principal importance (hedgerow); and populations of protected, rare or notable species groups of birds, bats and badgers.

In assessing the impacts on ecological receptors, account has been taken of embedded mitigation such as avoidance of habitat removal and retention of hedgerows through directional drilling. Creation of species rich grassland is also proposed as part of the Proposed Development. A sensitive lighting scheme has been designed to retain dark habitat for bats. Good-practice methods of working will be detailed and adhered to in the CEMP to minimise the risk of impact to species and habitats during construction.

Taking account of the avoidance, mitigation and compensation measures outlined in this chapter, no residual significant effects are predicted to result from either the construction phase or the operational phase of the Proposed Development.

A Biodiversity Net Gain Assessment is required under Local Planning Policy which will further enhance the Site's ecological value. The proposal includes an increase in biodiversity of the site of approximately 24.51% relative to current baseline conditions.

4.4 Landscape and Visual Amenity

In landscape and visual terms, it is considered that the Proposed Development comprises two distinct components, including the main AD site and, secondly, a buried pipeline connecting to two offsite digestate lagoons. As the landscape and visual effects of these two main components were anticipated to be distinct in terms of their potential impact i.e., each will affect different geographical areas, the LVIA consequently separates the assessments for these two main components.

Recreational Receptors

There would be a high level of visual impact from the PRoW that runs to the east of the Site boundary. Users would experience a high magnitude of change during construction that would be Significant, and which would inevitably be negative in nature. However, as the large area of proposed new woodland establishes this effect would be ameliorated and the long term impression would be positive, as the woodland contributes to the fabric of the local landscape character.

There would be limited visibility of the Proposed Development from the local road network with the main visibility arising from the A1307 along the northern edge of Haverhill, and further west where it has a junction with Silver Street. A large stand of mature poplars provides some good screening from this location but during winter views are likely to be more apparent. In the context of the route as a whole, the effects would be of an extremely limited duration.

The Assessment concludes that although the Proposed Development would be visible to a relatively limited extent, and through the appropriate use of colour and materials and the introduction of new landscape elements within the scheme, there would be a limited effect on the landscape character and visual amenity within the surrounding area. The landscape and visual effects would also be highly localised, only affecting parts of the local area within 500m-600m radius from the Proposed Development Site.

Residential Receptors

Longer range views - from around 500 metres distance - are achieved from an elevated stretch of Silver Street to the north, where a small number of residential properties are located. In these views, the Proposed Development would be set down below the landform of the foreground hillside, with only the tallest elements of the digestors on the AD facility Site seen above the intervening hedgerow. The digestor tanks would be painted a muted colour in order that they recede and blend into the background colours. The northern boundary of the AD facility Site would be subject to further hedgerow planting to reinforce it and to secure the long-term resilience of the boundary as a screening element for the Site, which will help to reduce the magnitude of change perceived along Silver Street by Year 10.

Other than these properties, the Proposed Development would be well concealed in views from the closest residential receptors around the AD facility Site. There would be some oblique views from upper storeys of a small number of residential blocks in Haverhill, from about 1km distance. The visual effects arising in Haverhill would be of a minor nature.

Beyond around 500m the effects on landscape character would diminish rapidly due to the level of screening in the intervening landscape. The effects would also reduce over time as a consequence of the further mitigation envisaged in the Landscape Strategy.

Pipeline

The construction of the pipeline is likely to cause short term local impacts which would be resolved once reinstated and vegetated, leading to the route being indiscernible in the landscape and views during the operational phase. The offsite digestate lagoon location has been carefully sited to achieve a good level of integration into the local landscape and to benefit from localised screening available from Cadge's Wood and nearby hedgerows. Further hedgerow planting will help to integrate this low-lying element into the landscape with only localised long term landscape and visual effects.

4.5 Noise

A Noise Impact Assessment has been undertaken which is based on the results of a noise survey carried out at locations representative of the nearest noise-sensitive receptors (NSRs) to the Site, over representative daytime and night-time periods.

The impact of the Proposed Development upon the noise environment at the nearest NSR to the Site was assessed based on a preliminary plant selection, as the most reliable currently available information and agreed with the client.

For the purposes of the Noise Assessment, Construction Noise was considered in phases, and assumed that each construction phase would be in isolation. The items of plant which would typically be utilised during each activity, the equipment sound power levels and the estimated percentage on-time of each item of plant were set out for each of the following phases:

- Phase 1 – Site clearance and enabling works.
- Phase 2 – Substructure works and access road.

- Phase 3 – Superstructure works.
- Phase 4 – Digestate Pipeline works.

For the purposes of assessing the operational phase, in addition to operational plant sources, heavy goods vehicle (HGV) movements within the Site were included in the model based on an estimated quantity of up to 2 no. HGV movements during the 1-hour daytime assessment period and 1 no. HGV movements (as a worst-case) during the 15-minute night-time assessment period. This has been based on traffic estimates for average HGV movements including 3 no. daily biomethane gas or CO2 tankers (which may occur during the day or night) and other feedstock / digestate deliveries typically occurring during daylight hours.

The Noise Assessment has concluded that the noise level during construction is predicted to lie significantly below the threshold value adopted for the assessment at the nearest NSR. Vibration impacts at the receptor are considered negligible. Noise and vibration from construction activity is therefore predicted to lie within acceptable limits where the impact is considered negligible with no significant effect.

The operational impacts of plant and processes have been reviewed in terms of an absolute, relative and change in environmental sound levels. The judgement has been made that the magnitude of impact is likely to be negligible during the day but may be moderate in the worst case, during the night-time, at the nearest receptors. The level of noise is deemed to be non-intrusive, such that it could potentially be heard during times of the night but is not such as to cause any change in behaviour or attitude or affect the character of the area to the extent that there is a perceived change in the quality of life. The effect level from noise impact has been judged not significant.

4.6 Traffic and Transport

The transport assessment considers the potential environmental impacts associated with the movement of vehicles associate with the proposed development. A Transport Statement (TS) has also been produced and submitted as part of the planning application and is references in the ES Traffic chapter.

Baseline Conditions

In terms of baseline conditions, the site comprises two adjoining arable fields which are part of the Spring Grove Farm, which is located approximately 3.1km northwest from the centre of Haverhill, a market town and civil parish in Suffolk; the site lies approximately 21km southwest from central Cambridge. In broader terms the application site is located approximately 21km southeast of central Cambridge, 52km west of Ipswich, and circa 75km north from Central London; links to the M11 can be found within 15km (by road) from the application site. Vehicular access to the application site can be gained to the south across a bridge and through a cutting in the railway embankment via private tracks which route through and adjacent to an estate
property forming two existing access junctions with the A1307.

The Thurlow Estate farming operation extends to the north, beyond the application site, covering a wide area. The Estate as a whole comprises numerous agricultural fields which are interconnected by a network of tracks which have historically supported all types of agricultural traffic; it is considered that these lanes are suitable for use in context of the proposals, where practical. Much of the existing Thurlow Estate is currently accessed via these lanes, which generates existing traffic on the network.

Traffic surveys were undertaken including an Automatic Traffic Count (ATC). The ATC measured directional traffic flow and vehicle speed, and classified vehicles into various groups including cars, motorcycles, and heavy goods vehicles (HGVs). The data findings are presented in the TS. Analysis confirmed that:

- the AM peak was observed between 07:00 & 08:00hrs; and

- the PM peak was observed between 17:00 & 18:00hrs.

New road infrastructure is planned locally, associated with the proposed northern extension to Haverhill, currently being developed by Persimmon Homes. This development comprises up to 1,150 dwellings, primary school and local centre/retail. A new relief road forms part of the proposals and construction is underway, with the roundabout with the A143 having been completed and fully operational.

The A1307, particularly to the west towards the Cambridgeshire border, has a history of accidents and is signed as a high casualty route, with road safety a real concern for local stakeholders. In order to conduct a comprehensive review SLR procured Road Traffic Collision data from Suffolk County Council to assess the accident history in the vicinity of the application site. Details of recorded road traffic incidents within a specified study area were requested for the most recent five-year period at the time of request, and the accident data is included within the TS. Following a thorough review of the data provided by Suffolk County Council including a detailed examination of each incident on an individual basis, it has been concluded that no incident occurring within the identified study area for the five-year period may be attributed to a highway deficiency of any kind, and that all recorded incidents are attributable to human error. It is therefore concluded that there is no safety issue in the immediate proximity of the proposals.

Proposed Operation

The AD process involves a biological process that is continuous. The processing plant would therefore be operational 24/7. The facility would be staffed by up to five full time equivalent (FTE) members of staff on-site during the hours of 07:00 – 19:00 Monday – Sunday, except during peak harvest periods when working hours would be extended as necessary. A supervisory control and data acquisition (SCADA) system would monitor the facility overnight when it is not manned. Deliveries of crops to site would be determined by the harvest. Harvests are ordinarily completed on a campaign basis, therefore during the peak harvest periods, delivery hours would be in line with standard agricultural harvest-time activity. Vehicle movements relating to delivery of agricultural by-products and export of digestate would generally be limited to the following hours:

- Monday – Friday 07:00 – 18:00; and
- Saturday 07:00 – 13:00.

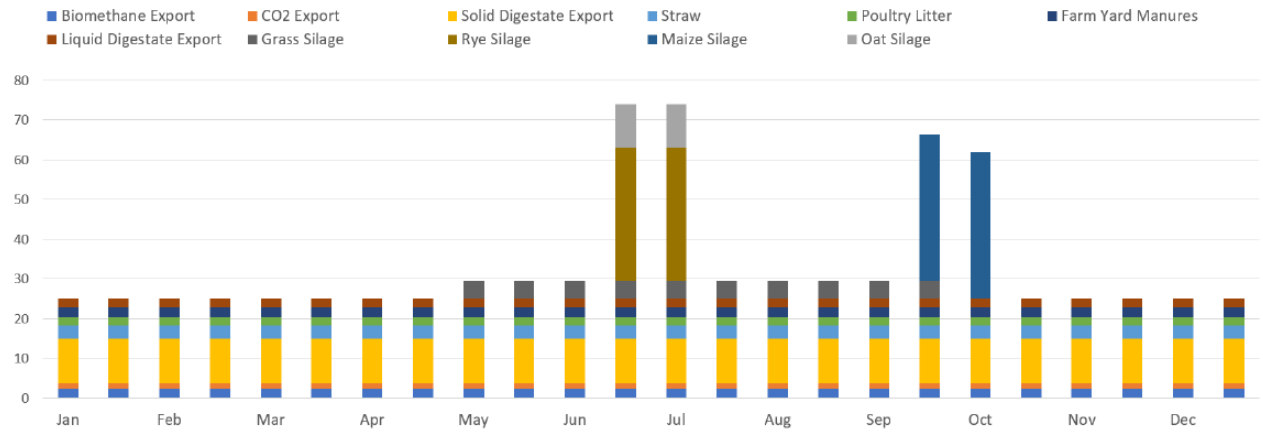
Gas collection and export would take place approximately twice each 24-hour period. CO_2 would be subject to one offtake by road tanker a day, including Sundays.

Feedstock import would include the silages, straw and manures, which would be transported to site via HGV/tractor-trailers from surrounding farms. Site exports would include biomethane, CO2, solid and liquid digestate which would be transported off-site via HGV/tractor-trailers.

The feedstock forecasting based on land yield potential and calculated product outputs informs the detailed traffic generation assessment. Due to the nature of some feedstock harvesting, some deliveries would follow seasonal patterns. Other imports would follow a more consistent pattern throughout the year.

The daily traffic forecast based on the predictions and delivery range is shown below. Where imports or exports have an all-year delivery range the traffic has been spread evenly across 260 days. Harvest periods are based on 7 day week campaigns. The graph represents the maximum forecasted loads per day during each half month period.

Figure 6-2
Proposed Maximum Daily HGV/Tractor Load Forecast



The graph shows how proposals are likely to result in a varied HGV traffic generation across the year. For the majority of the year (10 months) the development would generate 25-29 HGV/tractor trips per day, which equates to 50—58 HGV/tractor movements. Site traffic generation levels would then peak with seasonal harvest periods. This would likely be restricted to two weeks in June and July (Rye/Oat Silage) and two weeks in September and October (Maize Silage). Predicted traffic levels would peak for two weeks in June/July with up to 74 HGV/Tractor trips per day, which equates to 148 HGV/Tractor movements.

Regular feedstock movements such as the delivery of straw, manures, and other organic wastes will typically take place during the standard working hours of 0800 – 1700hrs. Agricultural import traffic will have the same diurnal variation as existing farm activity. All agricultural movements, including digestate, will therefore usually occur within daylight hours. Peak harvests periods will be operated by local farmers and casual staff using a limited number of owned/hired vehicles, not a large fleet. As such, traffic profiles would naturally be spread throughout the day, thus avoiding any congestion issues.

In terms of traffic distribution, the application site benefits from good access to the local strategic road network via the A1307 whilst being in close proximity to the Thurlow Estate farming operations from which it will be primarily served. HGVs relating to the haulage of gas products are likely to distribute to/from the west along the A1307 to the A11. HGV traffic distribution associated with the importation of feedstock and export of digestate will vary each year subject to market conditions and crop rotation. However, there are broad assumptions which can be made based upon the site location and local land yield potential. Table 6-4 provides a summary of local farms within the Thurlow Estate farming operation and the likely routeing requirements.

Table 6-4
Local Traffic Distribution Considerations

Farm Hub	Location in Relation to Proposed AD Facility	Likely Route	Comment
Weston Woods	North	**A1307 West** Silver Street Skippers Lane Common Road	Potential for estate traffic to use existing farm tracks to the north
Great Bradley	North	**A1307 West** Silver Street Skippers Lane Common Road	Potential for estate traffic to use existing farm tracks to the north *Could route via new Bypass*
Thurlow	North	**A1307 West** Silver Street Skippers Lane Common Road	Potential for estate traffic to use existing farm tracks to the north *Could route via new Bypass*
Great Wratting	North-east	**A1307 East** A143 B4061	*Could route via new Bypass*
Kedington	East	**A1307 East** A143	*Could route via new Bypass*
Rectory	North-west	**A1307 West** Haverhill Road West Wickham Road	-
Dotterel	North-west	**A1307 West** Haverhill Road West Wickham Road	-
Horseheath	West	**A1307 West**	-
Ashdon	South-west	**A1307 West** Dean Road	-

Construction Considerations

The application site benefits from good access to the local strategic road network via the A1307. Construction is expected that construction of the proposed development would take approximate 70 weeks. It is anticipated that the construction process would generate less HGV traffic than the proposed development operational phase. However, there would be a higher number of staff operatives, with up to 50 people on site during the peak of construction activity. In total, the construction process would generate approximately 3,000 HGV trips across the whole period, equating to an average of 11 HGV trips per day (or 22 HGV movements, so 11 in and 11 out) across a 275 day year.

It is proposed that construction activities, including deliveries, would be limited to 7am to 7pm Monday to Friday, with reduced hours on Saturday for the duration of the construction period. There would be no construction activities undertaken on Sundays or bank holidays without prior approval, unless in the case of emergency. In order to minimise traffic impacts on the A1307 Cambridge Road the construction site access junction will be constructed prior to the main construction phase commencing.

The construction phase must adhere to a Construction Traffic Management Plan (CTMP) which will ensure that site traffic is managed effectively during the construction process as to not result in any adverse impacts on the local highway, including ensuring that all staff parking is accommodated within the site away from the public highway; and all lorry parking/loading will occur within the site, away from the public highway. Subject to the implementation of a CTMP, the construction impacts are likely to be minimal, manageable, and therefore are acceptable in terms of highway operation and safety.

Safety and Capacity

Operational traffic associated with the movement of material would utilise the classified road network, where possible, using the 'B' classified roads, 'A' classified roads and motorways. Local imports would use the most practical roads which are likely to be via established agricultural routes.

The Site would be served by the A1307 which links with the A11 to the west. The A1307 is a classified 'A' road which currently accommodates an Annual Average Weekday Traffic (AAWT) flow of approximately 18,000 vehicles. It has a consistent standard carriageway width suitable for HGV movements.

It is predicted that during a 10 hour working day, the level of proposed traffic would equate to an average of 2-3 loads in and 2-3 loads out per hour, or an average of 1 arrival and 1 departure every 20-30 minutes. This low level of traffic can comfortably be accommodated at the proposed site access junction.

Site access has been designed as a two-way road which would ensure that there is adequate capacity to accommodate the proposed worst case traffic flows, which is likely to be during the month of June. Infrastructure between the Site and the A1307 Cambridge Road has an abundance of capacity, it is therefore predicted that the in context of potential queuing so there would be no stacking back onto the public highway. During peak harvest periods movements will be operated by local farmers and casual staff using a limited number of owned/hired vehicle and not a large fleet. The traffic profiles for harvest periods would be spread throughout the day and would avoid any congestion issues. Finally, the network of farm tracks to the north may be used by the Thurlow Estate related vehicles where practical, these offer direct access across private land using established routes. It is therefore considered that there would be no capacity concerns at the site access junction.

Environmental Impacts

Other than very occasional tankers, the proposed development traffic would not travel outside of the typical operational hours and as such the proposed development traffic would lead to no perceptible change in noise or vibration during hours of operation. The magnitude of the proposed development impact on noise and vibration would therefore be negligible, the sensitivity is low, therefore the overall impact significance is concluded as negligible.

It is considered that the development has been designed appropriately to reduce the risk of dust and dirt impacts. However, it is acknowledged that the transportation of agricultural materials in uncovered containers could lead to dust and dirt impacting the access route. It is proposed that there is mitigation implemented to reduce this impact. With this mitigation the impact is reduced from major to slight but would not cause a significant adverse impact.

Mitigation

The operation of the Site must adhere to a Traffic Management Plan (TMP) which is recommended to be secured as a Planning Condition. The TMP would pay particular focus to the crop harvest periods when traffic generation levels peak, ensuring that access junction activity is managed appropriately. The TMP would ensure that site traffic is managed effectively as to not result in any adverse impacts on the local highway. Measures may relate to HGV routeing, vehicle scheduling and other measures to prevent debris on the local highway.

The construction phase must adhere to a Construction Traffic Management Plan (CTMP) which is recommended to be secured as a Planning Condition. The CTMP would ensure that site traffic is managed effectively during the construction process as to not result in any adverse impacts on the local highway. The CTMP would include the following:

- detailed construction traffic forecast, including any abnormal load requirements;

- vehicle/plant/delivery scheduling;
- establish site access junction prior to main construction activities;
- staff parking to be accommodated within the site away from the public highway; and
- all lorry parking/loading will occur within the site, away from the public highway.

Conclusion

It is concluded that the residual transport impacts are negligeable/slight in terms of Noise & Vibration, Dust & Dirt, Driver Severance & Delay, Community Severance & Delay, Vulnerable Road Users and Road Safety. Therefore, in view of this, the application proposal is deemed acceptable in traffic and highways terms.

4.7 Water Environment

A hydrological and hydrogeological assessment was conducted for Chapter 10 of the Environment Statement, this assessment was based on a desk top assessment of existing hydrological regimes as well as a site-based survey.

The assessment of the sensitivity of the potential receptors is designated as follows, based on the review of baseline conditions;

- Shallow groundwater within superficial deposits – Low Sensitivity
- Lewes Nodular Chalk and Seaford Chalk Groundwater – High Sensitivity
- Stour Brook – High Sensitivity
- Flood risk – Medium Sensitivity
- Licensed groundwater abstractions – Low Sensitivity
- Over and Lawn Woods SSSI – Low Sensitivity
- Haverhill Railway Walks – Low Sensitivity

The Site and its 2km boundary lie within a SSSI Impact Risk Zone, nitrate Vulnerable Zone (NVZ) for both surface water and groundwater, a Drinking Water Safeguard Zone and within a Source Protection Zone 3.

Once constructed, the Proposed Development would introduce a number of new features into the previously greenfield site that will contribute to the impermeable area of the Site. The digestate tanks, digestate lagoons, sileage clamps, chicken shed, straw store, hardstanding, north lagoon digestate lagoons and other process equipment comprises 4.63ha or impermeable hardstanding.

Embedded or inherent mitigation measures to protect the water environment have been incorporated into the design of the Proposed Development as well as not the construction methods. Such measures would prevent or reduce potential impacts both during construction and once the Proposed Development is operational.

The Drainage Strategy for this Site includes:

- 1200m3 volume below ground containment tanks for contaminated water collected through drainage, channels, pipes and chambers;
- 1193m3 volume attenuation lagoon; and
- Full retention petrol interceptor.

The proposed AD plant will operate under an Environmental Permit, with a strict operational & maintenance procedure in place. As part of the actions under the permit, water quality checks would be required on the outfall locations, covering TSS, PH, volume & hydrocarbons. These would be recorded and submitted to the Environment Agency under the permit conditions annually or more frequently (pending permit conditions).

The general approach used has been to seek to avoid any potential effects as part of the inherent design process. This includes using suitable water-resistant construction materials, ensuring drainage provision does not significantly alter existing run-off regimes to the downstream hydrological network and minimising drainage channel crossings for site access.

The construction phase environmental impacts of the Proposed Development would be managed through the implementation of a CEMP which would be part of a discharge of requirements and include mitigation measures under the 'Considerate Contractors' process.

Construction good practice measures include but should not be limited to:

- To prevent erosion and run-off, minimise land disturbance and leave maximum vegetation cover;
- Minimise water entering excavations by using cut-off ditches;
- Materials storage areas will be established, managed and maintained throughout the construction process;
- Locate earthwork stockpiles away from open drainage channels to prevent sediment migration into the downstream SuDs network or Stour Brook;
- Collect runoff from construction areas (including dewatering from excavations) into a system where it can be recycled or treated (e.g., settlement tanks, silt lagoons, screens);
- Carry out activities involving potential pollutants, e.g., concrete or fuel, in dedicated areas which are designated so that spills, leaks, drips and contaminated run-off can be captured and disposed of; and
- Cover piles of burning materials like cement, sand and other powders and regularly inspect for spillages, and locate them where they will not be washed into drainage areas.

Concrete will be brought to the Proposed Development ready mixed, temporary bunds will be placed around any pouring operations to contain spillages and a spill response protocol will be developed for use by contractors. The preference will be for all vehicle washouts to take place off-site. Any drainage of water used for on-site washing will need to be collected and directed to a sump located in suitably lined and contained area for treatment prior to discharge. Any discharge will be in agreement with the EA.

It may be necessary to form a barrier within the excavation to ensure liquid concrete does not come in contact with strata that could provide a pathway to underlying groundwater. If required, either a geotextile liner or a sand layer would line the excavation in order to restrict the potential migration of concrete into the surrounding substrata. This would only be necessary if there was evidence following excavation of a potential connection to the Chalk aquifer and significant fracturing which could give rise to a potential for vertical groundwater flow.

The assessment found that, overall, the adverse residual effects of the Proposed Development on the water environment following the implementation of mitigation measures area considered Negligible or Minor for the construction and operational phases, with the effects generally limited to minor short term changes in surface water runoff, potential for increased sediment leading to local runoff, a higher potential for pollution from spillages of substances during construction and localised short term changes to shallow groundwater hydrogeology.

Taking into consideration the mitigation measures already embedded within or inherent to the design of the project including the incorporation of good practice techniques as defined in the CEMP, the changes to the water environment are not predicted to be significant.

5.0 CUMULATIVE EFFECTS

The EIA process also includes consideration as to whether any of the individual effects of the Proposed Development would combine to create a cumulative effect greater than the sum of the individual effects. Typically, combined effects occur when different activities associated with a project act upon the same environmental receptor (e.g., the additive effect of construction noise from upon local residents combined with dust arising from construction activities).

Some potential impact was identified through the course of the technical assessments. These constraints formed a focus for development of mitigation measures as set out by the technical specialists in the associated ES chapters. As a consequence, no significant in-combination effects, either individually or cumulatively, on the health or amenity of human beings or environmental assets are predicted.

6.0 Conclusion

The ES provides a detailed and objective analysis of the potential environmental effects of the proposed AD facility and has been undertaken in accordance with up-to-date guidance and standards.

The ES presents information to Suffolk County Council and other stakeholders to help them consider the environmental and amenity effects of the proposed development. All developments result in some level of environmental impact and EIA is to ensure that these impacts are understood and within acceptable limits. The conclusion of the EIA is that subject to the mitigation measures identified in the technical assessments, the Proposed Development could be constructed and operate with no significant adverse effects on the environment.

The ES sets out the results of careful, detailed and systematic research into the potential air quality, noise, traffic, ecological, cultural heritage, water environment and landscape and visual effects of the development and, where relevant, sets out modern and well-designed methods of mitigating the effects. These, along with the conclusions of the technical assessments which support the planning application, include measures which have been incorporated into the design of the AD facility as in-built mitigation measures, relating in particular to the measures to minimise the landscape and visual effects of the development; noise attenuation measures; site access design and odour and dust management controls. The ES also describes the details of the landscaping scheme which when implemented would lead to a 12.13% biodiversity net gain compared with the existing site.

The ES also demonstrates that the proposed AD facility would result in environmental benefits with regard to climate change and the economy. The Proposed Development would provide a sustainable means of generating carbon negative, renewable energy. It would provide employment during construction and operation, which in turn returns money into the local economy.

The proposed AD facility would produce biomethane which would be used to heat homes and fuel vehicles. The proposed development would provide enough green gas to meet the heating demand of 7,650 UK households. In comparison with standard UK grid emissions, the biomethane produced by the AD facility would have an equivalent saving of 31,000 tonnes of CO_2 each year, equivalent to taking 21,000 cars off the road. Energy self-sufficiency is increasingly important in these times of rapidly rising fuel prices and uncertainty over imported energy.

The production of biomethane would be in line with local and national targets for reducing CO_2 emissions and reducing reliance on fossil fuels, whilst also contributing to fuel self-sufficiency. In addition, the solid and liquid digestate would be spread on surrounding farmland in place of artificial fertilisers, thereby reducing the reliance on imported fertiliser. In summary, the Proposed Development could proceed in a way which minimises results in no significant adverse environmental effects and would provide a range of social, economic and environmental benefits.

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