BIOGANIX LTD BONBY

Bioaerosol Risk Assessment

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BIOGANIX LTD

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1. INTRODUCTION

1.1. Background

1.1.1. The Bioganix Ltd (Bioganix) facility at Bonby is a food waste handling facility, situated on Bonby Lane, Brigg, Lincolnshire, DN20 0PJ and is centred on approximate National Grid Reference TA 01519 16499. The site is currently permitted for disposing of or recycling animal carcasses or animal waste, at a plant with a capacity exceeding 10 tonnes per day of animal carcasses or animal waste or both in aggregate (EPR S6.8 A (1) (c). It is also permitted for physical treatment of non-animal by-products wastes.

1.1.2. Initial Planning Permission for the development was granted by North Lincolnshire Council on 10th August 2005 reference 2005/0736.

1.1.3. This Environmental Permit variation is primarily to ensure the new tank farm – Tank Farm 3 – is fully incorporated into the environmental permit. Drawings of the site showing the revised layout are presented in the updated Site Condition Report, reference HC1666-02. Tank Farm 3 is within the existing footprint of the site. However, its construction has led to other changes and improvements to site infrastructure as described below.

1.2. Summary of Changes

1.2.1. Bioganix are seeking to make the following changes to their existing Environmental Permit. These changes are described in more detail within the Supporting Statement reference HC1666-01.

- New Tank Farm 3, to provide more rapid response capacity; more storage pending analysis; better source separation and mixing and a dedicated landspread-compliant storage tank.
- An increase to the total permitted storage at any one time from 4000m3 to 8400m3.
- An increasing of throughput to 200,000 tonnes per annum.
- An increase in waste treatment capacity for the recycling of animal waste and physical treatment of non-animal by-products to 1500 tonnes per day.
- The acceptance of soapstock (permitted EWC code 02 03 04) from which oils are separated by use of sulphuric acid.
- Updated odour abatement technology to address Improvement Condition IC1 from Compliance Assessment Report (CAR report) QP3137JB/0345169.
- Improved drainage and rainwater harvesting.
- Improved secondary containment capacity.
- Extensions to the site footprint on the east and west of the existing permit boundary and to the southeast for additional vehicle holding as throughput increases.
- Area of permit overlap with Brigg Lane Biogas (BLB), where a short section of above ground pipework, less than 10m, passes over Bioganix permitted area.
- New generator powered by sustainable oils produced on site, to power the site.
- A revised air quality assessment to incorporate the new generator and model the impacts of the additional Tank Farm 3 building on air dispersion patterns to ensure no adverse changes to the overall impact.
- Changes to waste descriptions to ensure alignment with standard waste descriptions as they appear on the operator's landspreading permit and as agreed during a recent variation to the landspreading permit reference VP3995VC.

1.2.2. The potential for bioaerosol generation at the site comes from the handling of food waste and the use of a biofilter. The design of the odour abatement system is under review.

2. SITE DESCRIPTION

2.1. Site Setting

2.1.1. The site is located on Bonby Lane, Brigg, Lincolnshire, DN20 0PJ, centred on approximate National Grid Reference TA 01519 16499.

2.1.2. The site is located in low lying farmland approximately 6km south of the Humber Estuary. The village of Bonby is located approximately 1km to west/southwest and the A15 and Brigg Road (B1218) are located approximately 1km to the east.

2.1.3. The closest receptor to the site is the adjacent anaerobic digestion plant, to the north, which is operated by BLB. Feedstocks produced by Bioganix are pumped directly to the BLB.

2.1.4. There are a number of farms within the fields surrounding the site, the closest being Hall Farm (300m northeast, understood to be currently unoccupied), Manor Farm (300m south understood to be currently unoccupied), Grange Farm (800m northwest) and Bonby Top Farm (800m south).

2.1.5. The site lies directly over the Chalk aquifer, designated a principal aquifer by the Environment Agency and is in a Source Protection Zone 3: total catchment. A buried sand channel runs southwest to northeast through the site. The area of the site is designated as a nitrate vulnerable zone.

2.1.6. There are no recorded abstractions within 2km of the site and no surface water features within 500m.

2.1.7. Local topographical maps indicate a pond and well at Grange Farm, approximately 800m to the northwest. Several springs arise in the village of Bonby, draining westwards. The site is not in an area at risk from flooding.

2.1.8. The nearest SSSI is South Ferriby Chalk Pit, which is situated approximately 3.5km to the north of the site.

2.1.9. The Humber Estuary is 6km to the north of the site and this is designated as a Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar.

2.1.10. Local Wildlife Sites are listed as follows:

- Bonby Road Verges;
- Bonby Upper Meadow;
- Saxby Verges South;
- Hill Side Plantation; and
- Whiting Mill Bottom Road Verges.

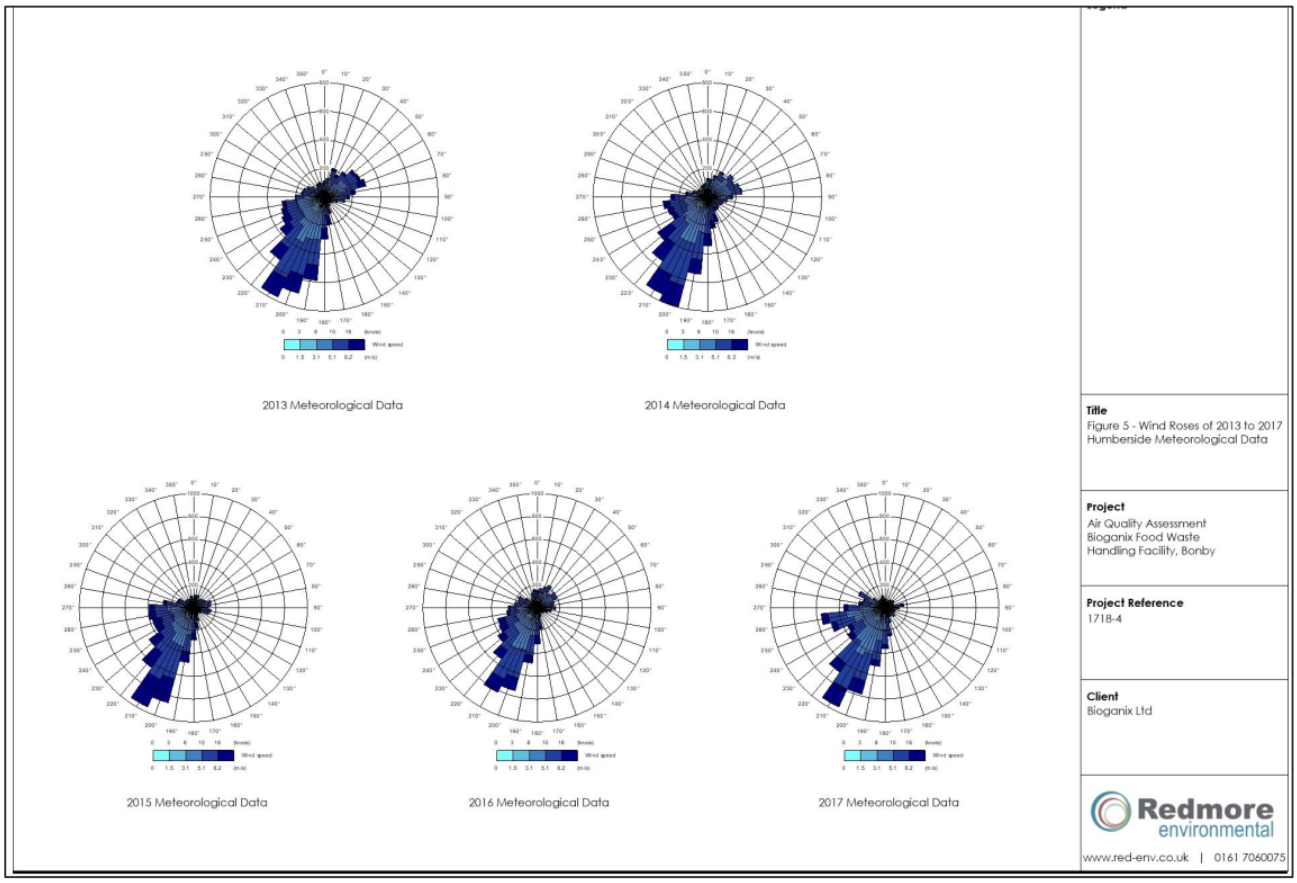
2.1.11. A Qualitative Environmental Risk Assessment of the site is presented as report reference HC1666-04.

2.2. Meteorological Conditions

2.2.1. The Air Quality Assessment presents wind roses based on data from 2013 to 2017 from Humberside meteorological station. The prevailing wind direction is southwesterly, refer to Figure 1.

This would make Brigg Lane Biogas the closest receptor and the most likely receptor to be down gradient.

Figure 1 Windrose Data (taken from Redmore 2020)



2.3. Receptors

2.3.1. A summary of local receptors is presented in Table 1. If receptors are identified within 250m of the site boundary, the risk from bioaerosols must be assessed.

Table 1: Local Receptors

Receptor Name	Grid reference	Distance from site	Description
Work Place and Residential			
Brigg Lane Biogas (BLB)	501468 416523	0 m	anaerobic digestion plant
R1 - Residential Manor Farm	501698 416064	300 m	(understood not to be currently occupied)
R2 - Residential Hall Farm	501629 416911	300 m	(understood not to be currently occupied)
R3 - Residential Grange Farm	500729 416921	800 m	Residential
R4 - Residential Bonby Top Farm	501454 415524	800 m	Residential
R5 – Residential Church Lane, Middlegate Road	500446 416262	1100 m	Residential
R6 – Residential Bonby Lodge, Brigg Road	502785 416545	1,200 m	Residential
R7 – Residential Northwold Farm	502443 415559	1,300 m	Residential
R8 – Residential Field House Farm	500362 417495	1,400 m	Residential
Conservation sites			
Bonby Road Verge	TA015163 – TA009155	50 m	Calcareous grassland
Saxby Verges South	SE996164 – TA004161	950m	Calcareous grassland, dense scrub.
Bonby Upper Meadow	TA006158	950m	A hay field on the site of an in-filled former chalk quarry. Main habitat: semi-improved neutral grassland.
Whiting Bottom Mill	TA013184 – TA024183	1.6km	Calcareous grassland flora

2.3.2. The pre-application response letter, reference EPR/FP3092NC/V011, 6/7/20 states that where a risk assessment indicates it is necessary and/or a sensitive receptor is within the distance stated in RPS209, a site specific bioaerosol risk assessment is needed. The relevant distance is less than 250m to a sensitive receptor.

2.3.3. Of relevance to bioaerosol assessment are places of human occupancy. From Table 1 the relevant human receptors within 250m of the site are limited to BLB site workers.

2.4. Site Processes

2.4.1. Treatments at Bioganix, Bonby involve depackaging, mincing, screening, mixing with liquid and adjusting consistencies to make liquid feedstock for anaerobic digestion. Residence times are low: less than 5 days and typically 24 hours. Biological treatment is not undertaken at the Bioganix food waste handling facility and it is a wet process This means the site is not high risk for bioaerosols.

2.4.2. All treatment processes take place inside a building with air extraction via an abatement system. All liquid deliveries take place via closed pumping line into closed tanks. Air displaced within the

building reception areas is channelled through the abatement system prior to release. All solid waste deliveries take place indoors. There are very few point source or diffuse release points.

2.4.3. The site has an enclosed biofilter. The filter media uses clay balls. There are two stacks on the biofilter with cowls.

2.4.4. Future odour abatement is being designed at present to fit the new configuration of the site. In terms of space to locate an open biofilter of sufficient size, this is likely to be restricted to areas east of the weighbridge. This would require significant ducting from the tank farms, which could reduce the effectiveness of the abatement. Other options for odour abatement are being examined and these may include scrubbers.

3. RISK ASSESSMENT

3.1. Hazard Identification

3.1.1. Principal sources of bioaerosols are composting, anaerobic digestion and mechanical biological treatment. The bioaerosol regulatory position statement RPS209 is primarily aimed at facilities that treat biological waste. Further guidance is given in EA technical guidance note M9: Environmental monitoring of bioaerosols at regulated facilities. Biological treatment of waste relies on microorganisms to breakdown the waste. Biological treatment is not undertaken at Bioganix, Bonby.

3.1.2. M9 describes bioaerosol monitoring from stacks (refer to TGN1), open biofilters and ambient emissions. The only process stacks at Bioganix Bonby are for the boiler and the sustainable oils generator. These are unlikely to be key sources of bioaerosols.

3.1.3. There are two stacks on the enclosed biofilter. There is no permit requirement to monitor for bioaerosols from these stacks.

3.1.4. Biological treatment does not take place at Bonby. The site operates a wet process. The current odour abatement system does have a biofilter.

3.2. Hazard Assessment

3.2.1. The site is not high risk for generation of bioaerosols from the process and waste turnaround is rapid. The existing biofilter system has a small footprint and is enclosed. The media is clay balls. It is shortly to be replaced. It is thought that the current permit requirement for bioaerosol monitoring may be a legacy issue associated with former Bioganix operations.

3.2.2. The replacement odour abatement system may involve scrubbers, in which case the likelihood of bioaerosol generation is reduced further. If the chosen solution is an open biofilter with woodchip media, this may slightly increase the potential for bioaerosol generation.

3.2.3. The closest receptor downgradient of the prevailing wind direction is BLB anaerobic digestion plant. This site involves biological treatment of waste, however, as a wet process the risks are also low.

3.2.4. Any measurement of bioaerosols at the Bioganix Bonby site must be undertaken with due attention to the prevailing wind direction at the time of sampling, so as not to record emissions from the AD plant.

3.3. Risk Estimation

3.3.1. The likelihood of bioaerosol generation at Bioganix Bonby is low. The BLB site, which receives its feedstock from Bioganix for onward treatment, is not, considered to be a sensitive receptor. Both sites are surrounded by farm land, which itself may also generate bioaerosols.

3.4. Mitigation Measures

3.4.1. The Bioganix site has rapid handling times, reducing the likelihood of decay of food wastes as it is handled. All processes are wet. They are under cover and largely take place in enclosed tanks. The site's Environmental Management System includes set cleaning procedures. The site operates under the Animal and Plant Health Agency (APHA) approval. This requires standards to be met for

cleaning, disinfecting and turnover of category 3 animal by-products. Odour abatement technology is being upgraded and may remove the need for a biofilter.

3.5. Risk Evaluation

3.5.1. The residual risk to BLB is considered to be low. There are no other sensitive receptors within 250m of the site.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. General

4.1.1. The processes at Bioganix, Bonby do not involve biological treatment of waste. The site has an existing, enclosed biofilter for odour abatement, which is shortly to be updated.

4.1.2. The site is not high risk for bioaerosol generation, but there is a receptor within 250m of the downgradient boundary. The receptor is an AD facility supplied by the feedstock generated by Bioganix. Therefore, the receptor is not considered sensitive.

4.2. Monitoring recommendations

4.2.1. Bioganix will monitor for bioaerosols up and down gradient of the operational area in line with the environmental permit. A review of the monitoring requirement will be undertaken when the final odour abatement system has been selected and installed. If the final odour abatement solution, selected on the basis of BAT, does not involve a biofilter, it may no longer be necessary to monitor bioaerosols.

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