DESIGN AND ACCESS STATEMENT

Proposed Plastic Recycling Facility and Additional Digester Tank

at

Rothwell Lodge Farm
Kettering Road
Rothwell.

for

Fernbrook Bio

prepared by

ABDS Ltd
architectural consultants
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1. **PROJECT DESCRIPTION**

1.01 This application follows the granting of planning permission under reference 09/00033 WAS for a Anaerobic Digestion facility at Rothwell Lodge Farm.

1.02 The plant has been operational since October 2010, and during this time the amount of plastic waste generated has far exceeded expectations. Fernbrook Bio Ltd have undertaken extensive research and sourced equipment capable of recycling this plastic waste, which at present is sent to landfill.

1.03 The recycling process involves washing, and shredding and drying of plastic material so that the plastic is left in a clean and dried pellet format for distribution to others for re-use.

1.04 The process equipment is however space intensive as can be seen from photographs below. It is therefore necessary for an additional building to be located on site to accommodate this process. It is important to note that no food waste will be processed within the new proposed building.
1.05 Additionally permission is sought with this application to increase capacity of the main plant to process 49,000 tonnes of food waste per annum. Although this capacity increase would involve no alterations to the main waste reception building or internal process plant an additional Digester Vessel would be required.
2. DESIGN

SITE CONTEXT

2.01 The existing site is located within the working farm known as Rothwell Lodge Farm. It is located directly off Junction 5 of the A14 trunk road. The dedicated access road loops round to the farmyard access and the site is located immediately west of the site entrance.

2.02 The proposed plastic recycling building would be located in close proximity to the existing Waste Reception building and is located on the edge of existing concrete paving. Minor alterations would be required to the existing drainage layout and the existing Digestate fill area.
2.03 The proposed additional Digester tank would be located within the existing containment bund, which has sufficient storage volume capacity. This would involve the repositioning of the existing maintenance access road. The tank would be of identical design, specification and size to the existing approved Digester tanks.
3. EXTENT OF BUILDING COVERAGE

3.01 Permission is sought to for a single storey building whose footprint area is 630m².

3.02 The site area equates to 2.28 hectares.

3.03 Permission is also sought to locate the following tanks within the site confines:-

a/ 1 No additional 3052m³ storage capacity Digester tank – 24.83m diameter x 6.3m wall height and 10.8m to top of roof.
4. RESPONSE TO SITE / BUILDING DESIGN STRATEGY AND BUILDING FORM

4.01 The design of the plastic recycling facility seeks to replicate the detailing of the existing Waste Reception building. The proposed building provides a duo-pitch span in order to minimise the height of the structure and ensure that the mass of the proposed building is no greater than the existing buildings on site.

4.02 The design of the building is a functional requirement of the process being undertaken. “Dirty” product into the building needs to be physically separated from “Clean” product out in order to adhere to Animal By-product regulations. The main process hall size is a functional requirement of the equipment layout being contained within. Material storage areas also need to be provided.

4.03 The height of the structure is a functional requirement of the equipment installed, along with a requirement for HGV vehicles being able to safely load and unload within the space.

4.04 Material selection for the proposed building will closely follow the existing Waste Reception. Composite cladding panels with graduated colour banding will replicate the existing design.
4.05 The proposed Digester Tank will exactly replicate the existing facilities on site, and will be clad externally to match the existing so that they blend with their surrounding environment.

![Existing Digester Tank](image)

**Environmental Design Considerations**

4.06 The building will be an unheated space and therefore heat loss considerations are not a consideration for the proposed plastic recycling building. However in order to minimise the potential for condensation forming internally, along with considerations such as odour control and noise transmission within the building the use of insulated roof cladding and insulated composite wall panels have been selected. Insulated sectional overhead doors along with secondary rapid action doors will also be utilised.

4.07 The proposed building will be constructed to the same standard and specification as the existing Waste Reception building. Noise transmission within the proposed building will be substantially less than elements of the existing Waste Reception building (ie CHP Room and Turbo separator). It is therefore suggested that the proposal will not result in an increase in noise transmission externally. Additionally air tightness within the building will be equal to the existing building.

4.07 It is not considered that odour will need to be addressed in the same manner as that specified and utilised within the main waste reception building, but it is appreciated that food remnants will form part of the dirty plastic entering the process and some level of odour control will need to be addressed. It is therefore proposed to install a ventilation system within the building that meets the following criteria:-

- A peripheral duct with suitable terminal devices will extract air from the process area to the air handler
- The air handler will have the facility for the installation of bag or activated
carbon filters and have variable speed control providing up to **five** air changes per hour to the process area

- The air from the fan section will be discharged into a mixing chamber via a baffle plate to create maximum turbulence
- Atomisers will introduce odour absorption liquid into the chamber creating a saturated atmosphere and largest possible surface area
- The chamber will be sized to provide optimum dwell time between the extracted air and the absorbent
- Air will exit the chamber via expansion section to create pressure drop and minimise liquid carry over and be discharged at high level via penthouse louvre

**LANDSCAPING**

4.08 The existing landscaping scheme implemented under permission 09/00033 WAS will be unaffected by the proposals. The proposed tank and building all sit within the curtilage of the existed developed area, and are therefore well screened by the existing landscaping. It is therefore proposed that no additional landscaping works are required as part of this application.
ACCESS

5 PHILOSOPHY STATEMENT

5.01 Fernbrook Bio Ltd is committed to a policy of equality, inclusion and accessibility achievable through good design. The basic right for access to and use of buildings for all is recognised as the most fundamental basis upon which the design should be established. The design process offers an opportunity to maximise individuals’ abilities to enjoy a safe and, wherever possible, independent participation. It is recognised that all individuals have a range of abilities which vary greatly and some of which may be impaired requiring consideration upon the Designer’s part to ensure that as wide a range of abilities as possible are accommodated. The design process is unique for each development as the distinctive requirements for a Client/End User will be specific to that project. For this reason we view the Client/End User as a part of the Design Team to ensure that the ‘inclusive design for all’ philosophy is adopted from the inception stage.

5.02 Fernbrook Bio Ltd endeavour to work to the latest legislation and good practice guidance available at the time, also taking into account advice and comments received as a result of consultations with Access Consultants and Local Groups. It is the aim of the developers to adopt the guidance from these sources so far as is reasonably practical for the type and nature of the building, the restrictions of the site and the intended occupiers.

6 DESIGN BASIS

6.01 The design requirements for the works are to provide the minimum required standards set out within Building Regulations Approved Document Part M 2004, and BS8300, that will afford reasonable access to all areas of the proposed building

6.02 The recycling process within the building will require manual dexterity and will require employees to be mobile. It is not considered therefore that wheelchair users will be directly employed within the building. Equally employing persons with hearing or visual impairment could be dangerous. It is not therefore considered that disabled persons will be employed for the most part within the building. Notwithstanding this the building design provides level access and disabled toilet facilities.

6.03 The existing Waste Reception Building will continue to serve as the main point of access for visitors. Reception, Office and Meeting facilities as well as general canteen facilities will all continue to be serviced from this building.

6.04 Through successful management of the completed site/building and continual review of its access policy, the Client/End User can ensure that any potential sources of discrimination are addressed in both the physical attributes of the buildings it uses and in the management practices and procedures it adopts.
7 CONSULTATION AND SOURCES OF GUIDANCE

7.01 Consultations will include the Building Control Approved Inspector with regard to the implementation of Approved Document to Part M of the Building Regulations (2004) and BS8300:2001. These are used as the main sources of reference, although not all of it is relevant to the proposed work.

Main design references used included: -

* Planning and Access for Disabled People – A Good Practice Guide (ODPM).

8. KEY ACCESS ISSUES OF THE DESIGN

8.01 Approach and Car Parking:

The existing development is accessible from J5 of A14. The access road into the site entrance slopes at a steep gradient towards the concrete paved farm entrance. However due to the site’s location there is no possibility of pedestrian access to the site and the steep gradient is therefore not considered an issue.

On entering the current facility it is noted that the paving is predominantly level. The car parking area has a nominal fall for drainage purposes. A single existing wheelchair-disabled car parking space is provided for staff and visitors within the car park adjacent to the main building entrance with drop kerb level pavement adjacent the spaces.

8.02 Pedestrian routes and external level change:

All approaches are concrete slabbed or Concrete paved and do not exceed a gradient of 1:20 with footways having cross-falls not exceeding 1:60. External lighting will be provided around the buildings and approaches with illumination to 50-100 lux.

8.03 Entrances.

The design of the building is intended to make the entrances clearly identifiable. Signage will also be used to highlight entrance doors.

All doors and frames will be finished with colours to contrast with their masonry wall surrounds.

The entrance is sheltered under the projected roof.

Entrance matting is recessed flush with the floor and is of an aluminium-ribbed type not to impede movement of wheelchairs or create trip hazards.

8.04 Horizontal circulation (including doors and corridors).

Corridors and passageways are designed to be minimum 1,200mm clear width with level floors.

Colour contrast of at least 20 points Light Reflectance Value (LRV) is provided
between walls and floors, walls and ceiling. Colour contrast of at least 20 points (LRV) is provided between door/door frames and surrounding walls, door face and leading edge to non self-closing doors and between Ironmongery and doors of minimum 20 points (LRV). Doors generally open into rooms. Doors to accommodation/rooms and toilet entrance lobbies are fitted with low power (30N) self-closing devices. All doors are designed to provide minimum clear opening widths, measured to the face of any protruding ironmongery, to comply with Building Regulations AD part M table 2.
Doors on access routes are fitted with vision panels towards the leading edge to provide minimum zone of vision between 500mm and 1,500mm from floor level.
Ironmongery door handles are selected to meet the requirements of BS8300 to be operable with one hand using a closed fist.

8.05 Sanitary accommodation.

A wheelchair accessible toilet is provided within the office space for staff and/or visitors. The colour scheme will be selected to ensure colour contrast of min 20 points LRV between floor and walls, walls and ceiling, cubicle doors and walls, sanitary ware and walls.

8.06 Information, signage and way finding.

Signage is be used throughout the facilities to provide information regarding directions for the locations of the following facilities: - Emergency escape routes. Signs are to be bold with high colour contrast between the lettering and between the sign and background. Text is to be in a clear type font utilising upper and lower case lettering. The size of lettering is to be selected to suit appropriate viewing distances in accordance with British Standards and The Sign Design Guide and Good Signs (Improving signs for people with a learning disability) Report to the Disabled Rights Commission. Where possible the use of pictorial diagrams to illustrate facilities available will be employed, for example: male, female and disabled symbols for toilet facilities. The Running man symbol will be used on escape signage in accordance with BS54499 Part 1 and Directive 92/58 EEC.

9. CONCLUSION.

9.01 The design and construction of the proposed building will achieve inclusive access for people of all abilities.
Appendix A  Bibliography

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Erection of New Digester Tank, Erection of New Plastics Recycling Building and Variation of Condition 3 of Planning Permission Ref: 10/00076/WAS to Increase Total Annual Throughput to 49,000 tonnes per annum
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1.0 INTRODUCTION

1.1 The following planning statement has been prepared in support of this planning application for the addition of an additional digester tank, the erection of a new building to provide for plastics recycling and to increase the total annual throughput of the site to 49,000 tonnes per annum (tpa).

1.2 The proposed scheme therefore consists of three parts:

   1. The erection of a new digester tank
   2. An increase in the annual throughput of the site from 30,000 tpa to 49,000 tpa, and
   3. The erection of a new plastics recycling building (630m²).

1.3 Parts 1 and 2 of the proposal are linked in that the success of the business and the scale of the market is such that there is demonstrable demand for an increased size of operation up to 49,000 tpa. To support the increased size of operation there is a need for an additional digester tank.

1.4 Through the operation of the current plant we have found that the feedstock received onto the site is contaminated by a larger amount of plastics than previously anticipated. The only option at the present time is to send this plastic to landfill as it is contaminated and unable to enter other recycling streams. The proposed plastics recycling building will clean and bale the recovered plastic such that it may enter the recycling process. The process and machinery used in the plastics recycling building is set out in greater detail within the Design & Access Statement.

1.5 The result of this application will be to increase the anaerobic digestion capacity of Northamptonshire, and increase the recovery rate of plastics from waste created in Northamptonshire. This is therefore considered to be an application which builds upon the success of this site and helps move additional waste tonnage up the waste hierarchy as targeted by the Core Strategy.

1.6 The new coalition government continues to promote sustainability as a key part of Government planning policy. In November 2010 DEFRA published a Framework Document expressing how the Coalition Government is committed to increasing energy from waste through anaerobic digestion (AD).
1.7 The statement will set out how the proposed development complies with local and national policy and is set out as follows:

2.0 Site Description

3.0 Planning History

4.0 Planning Policy

5.0 Planning Analysis

6.0 Conclusion
2.0 SITE DESCRIPTION

2.1. The site is located adjacent to the A14 at Rothwell Lodge Farm and can be accessed off both the east and west bound carriageways. The anaerobic digestion plant was granted planning permission in October 2009 (09/00033/WAS) and is now operational.

2.2. The site itself currently features a purpose built building along with one digester tank (two permitted), two pre storage tanks, one feedstock buffer tank and one digestate storage tank (two approved). There is some bunding around the existing tanks and extensive hardstanding to the frontage of the building to allow for the manoeuvring of HGV’s. Additional planting to the boundary of the site has been introduced to improve the setting of the site.

2.3. The nearest property is Rothwell Lodge Farm adjacent to the property. The surrounding area to the south of the A14 is agricultural, however to the north of the A14 lies Rothwell along with the highway and a service area.
3.0 PLANNING HISTORY

3.1. The planning history for the site is as follows:

**ROTHWELL LODGE FARM, ROTHWELL, KETTERING**

KE/94/0240 – Permission for machinery & grain store. (08/06/1994).


KE/97/0394/AG – Agricultural determination that extension to potato store was permitted development. (25/07/1997)

KE/02/0520/AG – Agricultural determination that erection of agricultural building was permitted development. (19/07/2002)

KE/03/0649 – Permission for conversion of traditional buildings to a single residential unit with home office. (01/10/2003)

KET/2007/0354 – Permission for dwelling with extended driveway. (15/06/2007)

09/00033/WAS – Permission for proposed construction and operation of anaerobic digestion waste processing facility, including: reception building; digestion and storage tanks; bio-filtration and ancillary development located on land at Rothwell Lodge Farm, Rothwell, Northamptonshire. (22/10/09) (Alternative Reference – KET/2009/0295)

10/00076/WAS – Permission to remove Condition 16 (Highway Safety & Access) of Planning Permission 09/00033/WAS at the anaerobic digestion waste processing plant, Rothwell Lodge Farm, Rothwell, Northampton, NN16 8XF. (26/01/11) (Alternative Reference – KET/2010/0751)

**ROTHWELL LODGE COTTAGES, ROTHWELL, KETTERING**

KE/02/0672 – Permission for continued outline permission for farm shop with ancillary horticultural sales. Demolition of existing dwellings. (10/10/2002)

**ROTHWELL LODGE PADDOCK**

KE/01/0845/TC – Permission for 15m Monopole, equipment cabinet, 6 antennas, 2 dishes. (20/12/2001)
SUMMARY

3.2. In respect of the AD plant, the site gained planning permission in October 2009 and through the construction process it became apparent that Condition 16 of the original planning permission required removal. This was formally dealt with in January 2011 and as such the planning permission issued under the Ref 10/00076/WAS supersedes, consolidates and updates planning permission 09/00033/WAS.

3.3. As a result, this planning application seeks to vary Condition 3 of 10/00076/WAS rather than the earlier planning permission.
4.0  PLANNING POLICY

4.1. The following planning policy is considered to be applicable to the proposed development.

NATIONAL PLANNING POLICY

4.2. The following national planning policies are considered relevant to the proposed planning application.

PLANNING POLICY STATEMENT 1 : DELIVERING SUSTAINABLE DEVELOPMENT

4.3. This Planning Policy Statement outlines the government’s objectives in delivering sustainable development. Paragraph 3 includes the widely used definition of sustainable development which is:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

4.4. Paragraph 13 outlines the government’s key principle which at sub paragraph ii) included the development of renewable energy resources. Paragraph 20 requires development plans to take account of environmental issues including the use of renewable energy and paragraph 22 requires development plan policies to encourage, rather than restrict, the development of renewable energy and encourage the prudent use of natural resources.

4.5. As such PPS1 is wholly supportive of all parts of the proposed development.

PLANNING POLICY STATEMENT : PLANNING AND CLIMATE CHANGE. SUPPLEMENT TO PLANNING POLICY STATEMENT 1

4.6. In the glossary to this document, renewable energy is defined as including energy from biomass and energy crops. Paragraph 9 requires all local planning authorities to prepare and manage the delivery of spatial strategies which make a full contribution to delivering (amongst others) the Government’s energy policies. Paragraph 13 requires Regional Spatial Strategies to set regional targets for
renewable energy generation and revise these upwards where appropriate in the light of delivery.

4.7. In preparing their Core Strategy and Local Development Documents, local planning authorities are required in paragraph 19 to:

“….provide a framework that promotes and encourages renewable and low carbon energy generation. Policies should be designed to promote and not restrict renewable and low-carbon energy and supporting infrastructure.”

4.8. In paragraph 20, local planning authorities are required to:

- Not require applicants for energy development to demonstrate the overall need for renewable energy nor question the energy justification
- Not preclude the supply of any type of renewable energy other than in the most exceptional circumstances with particular regard to landscape and townscape
- Take care not to stifle innovation including rejecting proposals solely because they are outside areas identified for energy generation

4.9. Paragraphs 21 and 22 encourage local planning authorities to consider using Local Development Orders to secure renewable energy supply systems.

4.10. Paragraph 40 of the Supplement states that an applicant proposing development that contributes to the key Planning Objectives (in this case the production of renewable energy and increasing recycling) should expect expeditious and sympathetic handling of the planning application. Paragraph 44 goes so far as to advise that local planning authorities should consider refusing proposals which prejudice existing renewable energy supplies.

**PLANNING POLICY STATEMENT 7: SUSTAINABLE DEVELOPMENT IN RURAL AREAS**

4.11. The policies in this Statement apply to all rural areas. Paragraph 5 encourages local planning authorities to support a wide range of economic activity in rural areas. Paragraph 16 advises that in determining planning applications, local planning authorities should provide for the sensitive exploitation of renewable energy sources in accordance with Planning Policy Statement 22: Renewable Energy.
4.12. This document outlines the Government’s policy towards waste management. Paragraph 1 emphasises the overall policy objective of minimising waste production and using it as a resource. This document has recently been republished (March 2011) following the publication of the revised waste hierarchy as set out within the revised Waste Framework Directive (2008/98/EC).

4.13. The only changes within this revision are to Paragraph 1 and Annex C.


4.15. Paragraph 22 states that when waste management proposals are in line with an up to date development plan, there is no requirement to demonstrate that there is a need for the proposal. Paragraph 24 states that unallocated sites should be considered favourably when they are consistent with the criteria outlined in paragraph 21. These are:
   - The extent the proposal supports the policies in the PPS
   - The physical and environmental constraints on the development including the existing and proposed land uses
   - The cumulative effect of previous waste disposal facilities
   - The capacity of the transport infrastructure
   - Within this priority should be given to Previously Developed Land and redundant agricultural and forestry buildings and their curtilages

4.16. In paragraph 29, local planning authorities are advised to consider the local environmental impacts of proposals. Paragraph 30 stresses that well run facilities should pose little threat to human health. Paragraph 32 outlines the scope of planning conditions.

4.17. The revised Annex C of the PPS explains the new waste hierarchy:
   1. Prevention
   2. Preparing for re-use
   3. Recycling
4. Other Recovery
5. Disposal

- The most efficient environmental solution is often to reduce the generation of waste, including the re-use of products - prevention;
- Products that have become waste can be checked, cleaned or repaired so that they can be re-used – preparing for re-use
- Waste materials can be reprocessed into products, materials, or substances - recycling
- Waste can serve a useful purpose by replacing other materials that would otherwise have been used – other recovery
- The least desirable solution where none of the above is appropriate - disposal

4.18. This section emphasises the importance of recycling and composting, and energy recovery with waste disposal only being an option when none of the other options are appropriate. Annex E of the PPS outlines the locational criteria which should be used to test the suitability of sites. These are:

Annex E

Locational Criteria

a. Protection of water resources;
b. Land instability;
c. Visual intrusion.
e. Historic environment and built heritage
f. Traffic and access
g. Air emissions, including dust
h. Odours
i. Vermin and birds
j. Noise and vibration
k. Litter
l. Potential land use conflict
PLANNING FOR SUSTAINABLE WASTE MANAGEMENT: COMPANION GUIDE TO PLANNING POLICY STATEMENT 10.

4.19. Paragraph 8.1 of this guide clarifies that normally proposals for anaerobic digestion are County Matters.

4.20. Paragraph 8.4 refers to unallocated sites. This emphasises the importance of not missing good opportunities where sites come forward outside of the plan led approach. Where proposals are consistent with the policies of Planning Policy Statement 10: Planning for Sustainable Waste Management and the Waste Planning Authority’s Core Strategy, the proposal should be considered favourably. Applicants should be able to demonstrate how their proposal encourages movement of waste up the waste hierarchy but otherwise there is no need for them to demonstrate need.

4.21. Paragraph 8.6 considers the concept of BPEO (Best Preferred Environmental Option). This clarifies that Planning Policy Statement 10: Planning for Sustainable Waste Management does not require this and that there is no policy requirement for this to be placed on an applicant. Rather the proposal needs to be consistent with the policies of Planning Policy Statement 10: Planning for Sustainable Waste Management.

4.22. Paragraph 8.7 emphasises the importance of good design and layout.

PLANNING POLICY STATEMENT 22: RENEWABLE ENERGY

4.23. Planning Policy Statement 22: Renewable Energy deals with renewable energy and contains a number of ‘key principles’. Amongst these are the following:

(i) Renewable energy developments should be capable of being accommodated throughout England in locations where the technology is viable and environmental, economic, and social impacts can be addressed satisfactorily.

(ii) Regional spatial strategies and local development documents should contain policies designed to promote and encourage, rather than restrict, the development of renewable energy resources. ….

(iii) The wider environmental and economic benefits of all proposals for renewable energy projects, whatever their scale, are material considerations that should be
given significant weight in determining whether proposals should be granted planning permission.

(iv) Small-scale projects can provide a limited but valuable contribution to overall outputs of renewable energy and to meeting energy needs both locally and nationally. Planning authorities should not therefore reject planning applications simply because the level of output is small.

(vii) ..... Developers of renewable energy projects should engage in active consultation and discussion with local communities at an early stage in the planning process, and before any planning application is formally submitted.

(viii) Development proposals should demonstrate any environmental, economic and social benefits as well as how any environmental and social impacts have been minimised through careful consideration of location, scale, design and other measures."

4.24. With regard to local considerations paragraph 15 states:

“Local landscape and local nature conservation designations should not be used in themselves to refuse planning permission for renewable energy developments. Planning applications for renewable energy developments in such areas should be assessed against criteria based policies set out in local development documents, including any criteria that are specific to the type of area concerned.

4.25. However in the case of the application site no landscape designations exist.

4.26. Paragraph 22 stresses the need to ensure renewable energy developments are located so as to minimise increases in ambient noise levels.

4.27. With regard to biomass projects paragraph 24 advises planning authorities to ensure traffic generation is minimised by locating generation plants,

"in as close a proximity as possible to the sources of fuel that have been identified."
4.28. However the statement goes on to recognise that other factors may be equally as important in determining applications for proposals e.g. connection to the Grid and the potential to use waste heat.

4.29. Paragraph 25 stresses that developers should themselves deal with any impacts on aircraft, radar, power lines, roads etc. before making applications.

COMPANION GUIDE TO PLANNING POLICY STATEMENT 22: RENEWABLE ENERGY

4.30. Published with Planning Policy Statement 22: Renewable Energy the guide gives additional information on renewable energy proposals. Para 5.4 stresses that,

“local planning authorities should recognise that the landscape and visual effects will only be one consideration to be taken into account in assessing planning applications, and that these must be considered alongside the wider environmental, economic and social benefits that arise from renewable energy projects.”

4.31. The Guide advises that applications should demonstrate that any renewable energy project should,

- meet development plan policies;
- does not conflict with any relevant area designation (such as landscape);
- addresses issues of visual impact;
- address environmental, social and economic benefits specific to the proposal.

4.32. In determining applications authorities are expected to:

- assess conformity with planning policies;
- assess impact on planning policy designations;
- the extent of positive and negative impacts and their mitigation;
- contribution towards meeting regional renewable targets.

4.33. Authorities are also expected to answer the following questions when considering applications.
- Does the proposal satisfy the relevant criteria-based policies in RSS and detailed policies in the LDD?
  - (Regional Spatial Strategy and Local Development Documents)
- How significant is any non-compliance? Could this be dealt with by condition or by requiring measures in a planning obligation (Section 106 Agreement) which mitigate adverse impact?
- Have application-specific matters such as landscape and cumulative visual impact been properly addressed?
- Could measures be taken to mitigate impacts during construction and after the plant is in operation?
- Can a condition be applied to cover restoration of the site should operations cease? (feasibility will need to be taken into account).

4.34. Paragraph 5.13 emphasises that although broad areas for renewable energy generation are expected to be designated in regional planning strategies,

   “the identification of broad areas does not imply that projects coming forward in areas outside them should automatically be considered for refusal. In all areas the compliance with criteria-based policies is the key determinant.”

4.35. The PPS gives guidance on how to assess the landscape impact of development including their cumulative impact.

WHITE PAPER - LOCAL GROWTH: REALISING EVERY PLACE’S POTENTIAL

4.36. This white paper was presented to Parliament on 28 October 2010 and sets out how the coalition government will help bring the economy back to health. This document as a white paper is Government policy and sets out a framework on which future policies may be based.

4.37. In terms of planning it considers that the current system is the wrong way round and alienates communities and thus fails in its function of supporting economic development. The Government sets out that planning should actively encourage growth.
4.38. Para 3.42 sets out that the UK has a legally binding target of generating 15% of energy from renewable sources by 2020 and is committed to delivering a huge expansion of UK renewable energy of the next decade. The white paper also notes that feed in tariffs will be improved in the next formal review.

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**PLANNING FOR GROWTH – SPEECH BY GREG CLARK MP – 23 MARCH 2011**

4.39. This speech followed statements by the Chancellor of the Exchequer and his call to action on growth. Planning has a key role in delivering this growth and as such this statement sets out the steps the Government expects local planning authorities to take with immediate effect.

4.40. The Government’s top priority in reforming the planning system is to promote sustainable economic growth and jobs. The Chancellor has set out on the Government’s commitment to introduce a strong presumption in favour of sustainable development in the forthcoming National Policy Framework.

4.41. The Government expects local planning authorities to deal promptly and favourably with applications that comply with up to date plans and national planning policies; and wherever possible to approve applications where plans are absent, out of date, silent or indeterminate.

4.42. Local planning authorities should support enterprise and facilitate housing, economic and other forms of sustainable development. They should also ensure that they do not impose unnecessary burdens on development.

4.43. Local planning authorities are obliged to have regard to all relevant considerations and should ensure that appropriate weight it given to the need to support economic recovery and applications that secure sustainable growth treated favourably.

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**THE ADOPTED EAST MIDLANDS REGIONAL PLAN MARCH 2009 (RSS)**

4.44. While the Government still plan to abolish Regional planning guidance in the near future, they are still extant and therefore have weight in the decision making process.
4.45. This document provides regional planning policy for the East Midlands Region within which local authorities can prepare their planning documents. There are a number of policies directly relevant to the proposal.

Policy 24: Rural diversification.

Local Authorities, EMDA and Sub-Regional Strategic Partnerships should work together to promote the continued diversification and further development of the rural economy, where this is consistent with a sustainable pattern of development and the environmentally sound management of the countryside. Local Development Documents should develop the policy according to local circumstance but particular consideration should be given to:

- Economically lagging rural areas identified by the Government’s Rural Strategy, including the Districts of East Lindsey, West Lindsey, South Holland, Bolsover, High Peak, and the more rural parts of the Derbyshire Dales, Bassetlaw and Newark and Sherwood; and
- Those areas that fall within Rural Action Areas identifies by SSP’s.

4.46. Paragraph 3.3.59 states that the East Midlands is expected to generate about 22.2 million tonnes of controlled waste. While waste reduction is considered a priority, waste planning authorities are also encouraged to reflect the need for additional waste management facilities.

4.47. A wide range of facilities are referred to including anaerobic digestion (paragraph 3.3.62). Within the region as a whole waste management capacity will need to more than double by 2020 and Figure 4 on page illustrates that Northamptonshire County is likely to suffer from both treatment and disposal capacity gaps at 2020. Figure 5 on page 84 provides details of the capacity shortfall likely for MSW within the region and each county. Retention and enlargement of existing facilities and the provision of new ones are therefore encouraged.
4.48. Northamptonshire County falls within the southern sub-area and will experience the greatest growth within the region. A centralised pattern of waste management facilities based around the existing urban centres is therefore proposed.

4.49. Policy 38 of the Regional Spatial Strategy sets out targets for the provision of waste management capacity with reference to time specific targets referred to in Appendix 4. In the southern sub area, the policy encourages a centralised pattern of large facilities based around the expanding urban centres. Waste facilities are encouraged to be sited to avoid pollution or disturbance to designated waste conservation sites. Increased traffic levels on roads near to sensitive sites should be avoided.

4.50. The RSS also has policies relevant to renewable energy production. Para 3.3.84 of the RSS states that renewable energy production in the region currently stands at 2% of energy production while the targets included in the RSS stand at 20% for 2020. Indicative renewable energy targets for the region are included at Appendix 5. Current capacity for anaerobic digestion stands at 1MW (2006) with a target of 5 MW for 2010 and 8 MW for 2020. Para 3.3.85 clarifies that these targets are indicative only and should not be regarded as maximum figures which cannot be exceeded.

4.51. Para 3.3.85 also clarifies that there needs to be a complete change in current planning practice to achieve these targets and that local planning authorities need to accept far more energy generation schemes. The southern sub-area is considered to possess significant opportunities for new biomass developments.

4.52. Policy 40 outlines regional priorities for low carbon energy generation and requites local planning authorities to promote a distributed energy network using low carbon and renewable resources, to achieve the targets in Appendix 5. Where environmental, economic and social impacts can be addressed satisfactorily, such proposals should be supported. In establishing criteria for new facilities required for forms of renewable energy other than on-shore wind, Development Plans and future Local Development Frameworks should give particular consideration to:

- The proximity to the renewable energy resource;
- The relationship with the existing natural and built environment;
- The availability of existing surplus industrial land in close proximity to the transport network; and
• The benefits of scale grid and non grid connection micro generation.

LOCAL PLAN POLICY

4.53. Since the original 2009 application the Northamptonshire Minerals and Waste Development Framework Core Strategy has been adopted and as such replaces the Waste Local Plan.

NORTHAMPTONSHIRE MINERALS AND WASTE DEVELOPMENT FRAMEWORK – CORE STRATEGY

4.54. The Core Strategy was adopted in May 2010 and is considered to be an up to date piece of guidance. However since the publication of a revised PPS10 (March 2011), the waste hierarchy as set out within the Core Strategy does not match that within national and European guidance.

4.55. Section 5 of this document sets out the vision and objectives of the plan and includes at Objective 1 ‘development of a modern network of sustainable waste management facilities’.

4.56. Objective 5 goes onto say that the Council should ‘facilitate the delivery of a strategic urban-focused flexible waste management network which supports the treatment of waste close to where it has been generated, with particular encouragement of integrated waste recovery and treatment facilities’.

4.57. Section 6 sets out the capacity of waste management which needs to be met through the life of the plan.

4.58. Box CS3 and Plan CS3 set out the spatial strategy for waste management within Northamptonshire and the locational hierarchy. This includes the acceptability of Rothwell as a location for development.

4.59. Policy CS1 sets out Northamptonshire’s waste management capacity and Policy CS2 the spatial strategy for waste management.

Policy CS1: Northamptonshire’s waste management capacity
The development of a sustainable waste management network to support growth within Northamptonshire will involve the provision of facilities to meet the following indicative waste management capacities during the plan period:

- Recycling (MSW and C&I) capacity of 439,000 and 516,000 tonnes per annum for 2016 and 2026 respectively,
- Biological processing (MSW and C&I) capacity of 423,000 and 498,000 tonnes per annum for 2016 and 2026 respectively,
- Waste management or advanced treatment (MSW and C&I) capacity of 392,000 and 456,000 tonnes per annum for 2016 and 2026 respectively,
- Inert recycling (C&D) capacity of 928,000 and 1,089,000 tonnes per annum for 2016 and 2026 respectively, and
- Hazardous waste management of 72,000 and 82,000 tonnes per annum for 2016 and 2026 respectively.

This provision will come from a mix of extensions to existing sites, intensification or re-development of existing sites and new sites, providing they all meet the spatial strategy for waste management and are assessed as meeting environmental, amenity and other requirements. Allocations that will contribute to meeting provision will be identified in the Locations for Waste Development DPD.

**Policy CS2: Spatial strategy for waste management**

Northamptonshire’s waste management network, particularly advanced treatment facilities with a sub-regional or wider catchment, will be focused within the central spine, and the sub-regional centre of Daventry. Development should be concentrated in Northampton, Wellingborough, Kettering, Corby and Daventry. Development in the smaller towns should be consistent with their local service role.

Facilities in urban areas should be co-located together and with complementary activities.

At the rural service centres, facilities with a local or neighbourhood catchment will provide for preliminary treatment in order to deal with waste generated from these areas.

In the rural hinterlands only facilities with a local or neighbourhood catchment providing for preliminary treatment, or that are incompatible with urban development, should be provided. Where it is the latter they should deal with waste generated from identified urban areas and be appropriately located to serve those areas.

Facilities in rural areas should, where possible, be associated with existing rural employment uses.
4.60. This plan effectively replaces the Kettering Local Plan and has become the statutory development plan document for East Northants, Corby, Kettering and Wellingborough Districts along with other documents that form the Local Development Framework. The plan contains a specific chapter on addressing climate change and paragraph 4.14 states that:

“There is a national requirement to reduce carbon emissions by 60% from their levels in 2003 by 2050 and for 20% of electricity generation to be obtained from renewable sources by 2020.”

4.61. The Core Strategy sets a very ambitious target of providing 30% of the demand for energy on new large development sites to be provided on site from renewable or low carbon sources, although the Joint Planning Unit now accepts that stand alone energy projects will also be required to achieve this. Paragraph 4.14 goes on to say that:

“In recent reviews of renewable energy potential, the Southern Sub Area (which includes North Northamptonshire) of the East Midlands Region has been found to offer the best opportunity for new carbon neutral development.”

4.62. This is in line with new and emerging Government and Regional policy, which also advocates new sites for renewable energy developments. Whilst there is currently no specific policy in the Core Strategy, with regard to the location of renewable energy sites that include biomass plants, paragraph 4.14 continues to state that:

“…decentralised biomass fuel plants will, in principle, be considered favourably in North Northamptonshire.”
impact on the surrounding environment. This can then influence public perceptions and acceptance of these types of development.

4.64. Following the publication of the Core Strategy, this SPD is to be reviewed and updated. The draft reviewed SPD for consultation went to Cabinet on 12 April 2011 and consultation is planned to commence on 2 June 2011. The current SPD remains valid.

PRINCIPLES

4.65. All proposals for minerals or waste development must prepare and submit a Design Statement and Restoration Scheme with the planning application. This can be part of the Design and Access Statement, and must be approved before the commencement of the development.

4.66. It will be assessed in accordance with the Principles for the Design of Minerals and Waste Development and the Principles for Restoration, After-Care and After-Use (both summarised below) and other relevant government guidance.

PRINCIPLES FOR THE DESIGN OF MINERALS AND WASTE DEVELOPMENT

4.67. The following criteria sets out the principles for the design of minerals and waste development.

- **High Quality Design**
  - In context with and complementary to surrounding landscape.

- **Holistic Design**
  - Consistent architectural treatment of all components of the built form.
  - This includes all buildings, building components, storage areas, structures, boundary treatments and service infrastructure.

- **Local Distinctiveness**
  - Support local distinctiveness and character
• Environmental Protection and Enhancement

- All design aspects should avoid/mitigate adverse impacts on the surrounding environment and human health, whilst maximising beneficial outcomes.

• Sustainable Development

- Incorporate sustainable development practices – prudent use of natural resources, waste minimisation and energy efficiency.

• Strategic Site Layout

- Seek to reduce impact on both the immediate surrounds and the broader landscape through site layout.

• High Quality Landscaping and Boundary Treatments

- Landscaping and boundary treatments that are in context with and complementary to surrounding landscape character.

- These should then be maintained to a high standard, and positively contribute towards amenity, biodiversity and nature conservation.

• Effective Buffers

- Provision of adequate and effective buffers to reduce impacts on sensitive receptors or areas.

- Buffers should be in context with and complementary to surrounding landscape.

- They should also seek to positively contribute towards amenity, biodiversity, nature conservation, habitat enhancement and catchment conservation.

• Lighting

- Minimise light pollution, including sky glow, glare and light spill.

• Site Access

- Site entry and public accesses are well maintained and act to reduce the visual impact of the site.

- Public rights of way should be maintained where possible
Access to major transport networks should seek to reduce the wider impacts on sensitive receptors.

- **Sustainable Transport**
  - Incorporate sustainable or alternative transport options where possible.

- **Integrated Development**
  - Maximise opportunities to locate complementary operations and activities together.

- **Public Safety**
  - Seek to ‘plan out crime’ through design, layout and landscaping.
  - Create a safe and secure environment, and make crime more difficult to commit.

4.68. The Supplementary Planning Document requires a detailed written Design Statement (including layout and design plans) demonstrating the practical implementation of the Principles for the Design of Minerals and Waste Development. Issues to do with restoration are less relevant to this proposal as the intention is to create a permanent facility which will recycle waste in the long term as an ongoing process which is different from landfill or similar operations which are by their nature temporary.

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**NORTHAMPTON MINERALS AND WASTE DEVELOPMENT FRAMEWORK - CONTROL AND MANAGEMENT OF DEVELOPMENT DPD**

4.69. An Inspector’s report into this document was published 16 May 2011 and a corresponding document for adoption published some days later. As this document has reached an advance stage in its production and only requires the agreement of the full Council before full adoption, significant weight has to be given to this emerging document.

4.70. This document covers aspects of controlling and managing minerals and waste development such as development criteria and locally specific issues.

4.71. Policy CMD3 gives development criteria for inert waste disposal and recovery which covers this application. Policy CMD7, 8, 9 & 10 set out additional guidance on how
new minerals and waste developments should take account of design and layout and how natural resources should be taken into account.
5.0 PLANNING ANALYSIS

5.1. The existing Anaerobic Digestion (AD) plant was granted planning permission 22 October 2009. The AD plant is now operational following resolution of concerns from the Highways Agency and a deletion of a highways condition from the 2009 approval. This planning application follows this approval and builds upon the success of the current operation.

THE PROPOSED DEVELOPMENT

5.2. As set out within the introduction there are three facets to the application, of which two parts are linked, the increase in total annual throughput to 49,000 tpa and the introduction of an additional digester tank. The third part, which is the introduction of a plastics recycling building is in response to the ongoing operation of the AD plant and the amount of plastic contamination currently found in the waste stream. This will help increase the amount of waste diverted away from landfill.

5.3. Processing the plastic is a space intensive process and as such cannot be accommodated within the existing building upon the site and requires a new separate building.

5.4. The plastics recycling building is designed to take in plastics brought onto the site as part of the waste stream for the anaerobic digestion plant. Normally this waste would go straight to landfill as it is contaminated. This new facility would clean and bale the plastics fraction such that the waste is diverted from landfill and can then be recycled.

5.5. As the plastics fraction totals 15 tonnes a week (at present operational levels), this is approximately 780 tonnes of waste per annum which will not have to go to landfill. Should permission be granted for the total annual throughput to be increased, the amount recovered will also increase.

5.6. In terms of how the building will operate, dirty plastics will enter the dirty side of the building from the main reception building following separation from the main waste element. The plastic will then pass through a washing process to clean it of all waste. Waste water from this process will be fed back into the AD system.
5.7. The clean plastics will then be baled and stored in the clean part of the building prior to onward shipping to a specialist plastics recycler. Additional details of the process and the machinery to be used within the building is set out in greater detail within the Design & Access Statement.

5.8. The main issues for consideration in relation to the proposed development are considered to be:
   - The principle of the proposal in planning policy terms
   - Employment
   - Design
   - Traffic and Access
   - Landscape / Visual Impact
   - Natural / Historic Environment (including archaeology)
   - Impact on Agricultural Land
   - Water Resources and Ground Conditions
   - Effects on Local Amenity including noise, odour and dust

5.9. The majority of the points considered will be based upon the discussion and consideration which the County Council made in the Officer’s report in respect of the original application upon the site.

**PRINCIPLE OF DEVELOPMENT**

5.10. There is a well established local, regional, national and European need for the management of waste and to reduce the reliance on landfill. As set out within previous sections, there is an increasing support for AD at the national level as it has the potential to help the country reduce greenhouse gasses and increase the production of renewable energy such that the legally binding 15% target can be met.

5.11. The White Paper issued by the Government in October 2010 (Local Growth: Realising Every Place’s Potential) sets out how the planning system should support growth and that they support a huge expansion of renewable energy installations. This is very much in accordance with PPS4, which considers that Local Planning Authorities should treat applications which secure sustainable economic development favourably (Policy EC10). All of the above accords with the overarching goal of providing sustainable development, as expressed within PPS1.
5.12. This is a form of development which aids the production of renewable energy and also helps increase the amount of waste being recycled within the County. The benefit from a reduction in CO\textsubscript{2} emissions from energy through the production of renewable energy along with the benefit of harmful methane being converted to less harmful CO\textsubscript{2} means that the benefits of the application clearly accord with national planning goals.

5.13. As sustainable economic development which will generate additional employment for the local area, in line with the guidance set out within PPS1 and PPS4 there is an in principle support for the scheme.

5.14. The Core Strategy sets out the strategic approach to waste within Northamptonshire. Policy CS1 sets out the waste management capacity required, with Policy CS2 setting the spatial strategy. Table CS3 of the Core Strategy sets out that there is a capacity gap of 221,000 tonnes for biological processing within Northamptonshire.

5.15. The additional waste management capacity of this development would clearly aid in the Council meeting the goals set out in Policy CS1 and Table CS3. Given that the proposal seeks development within the central spine, but would remain of an appropriate scale, it can be considered to accord with Policy CS2.

5.16. The facility was defined as a local/sub-regional facility within the previous application, which according to the previous Waste Local Plan was defined as facilities dealing with 50,000 tonnes or less per annum. A similar figure does not appear to be present within the current Core Strategy. The increase in tonnage handled by the facility would be in accordance with this figure and the site area has not increased.

5.17. Objective 5 of the adopted Core Strategy notes that the plan should facilitate a flexible waste management network and particular encouragement is given to integrated waste recovery and treatment facilities. With the addition of the plastics recycling facility this would in effect be a small sized integrated facility which would offer greater efficiency and greater waste recovery/usage.

5.18. The size of the building proposed and the proposed revised tonnage restrictions imposed as part of the planning permission are sufficient to ensure the size of the
operation is not inappropriate for the location and would not exceed the size of operation envisaged at the time of the original planning permission or within the current LDF.

5.19. In summary there is considered to be an in principle support for developments such as this which facilitate a decrease in the amount of material going to landfill, decrease the amount of CO\textsubscript{2} production through the conversion of methane to CO\textsubscript{2} and produce renewable energy. The proposed development would also accord with the principles of development set out at the national level and within the Core Strategy.

### EMPLOYMENT

5.20. PPS4 positively encourages sustainable economic development and directs LPA’s at Policy EC10 to treat applications for this form of development favourably. The Coalition Government have also set out within their recent white paper that planning should support growth and aid the UK economy in once again attaining growth.

5.21. The existing site already provides four full time positions and additional subcontractors as required, which are mainly occupied by residents local to Rothwell. The proposed increase in waste accepted by the site and the introduction of the plastics recycling building would create an additional four full time positions.

5.22. It is envisaged that these new jobs would be filled by local residents and as such would strengthen the existing link the facility has with the town of Rothwell. The provision of additional jobs for local residents would support the vitality and viability of Rothwell while also supporting national and local goals in respect of recycling, waste management and renewable energy production.

### DESIGN

5.23. The new development upon the site would feature an additional digester tank and an additional building to accommodate the plastics recycling facility. The design of the existing building upon the site is simple and functional and the proposed new building is designed in a similar way such that it visually integrates with development already on the site and also the wider area.
5.24. An extract of the plans is shown below and sets out the simple but pleasant design of the proposed building in line with that of the existing buildings upon the site. The panelled cladding will be of the same colour scheme and design as that which features on the existing building.

![Front Elevation](image.png)

5.25. The proposed new digestion tank is the same size and design as that which are already present upon the site and will be coloured in the same green as the existing tanks. The new tank would be located adjacent to the existing two digestion tanks and also adjacent to the existing and proposed building, as set out on the supplied site layout plan.

5.26. The colour scheme of the proposed tank and building would take advantage of the previously agreed colour scheme such that contrast with surrounding vegetation, agricultural buildings, A14 and skyline is reduced. The presence of existing landscaping and land contours would combine to create a high quality of design.

5.27. Policy CMD10 of the emerging Control & Management of Development DPD sets out a number of design criteria regarding design quality. The design of the existing building was found acceptable and given that the proposed development would have a similar appearance it is similarly considered that it is acceptable and would accord with the requirements of Policy CMD10.

5.28. It is therefore considered that the overall design of the building would be of a high quality and would accord with the requirements for high quality design.
TRAFFIC AND ACCESS

5.29. Pre-application discussions with the Council set out the requirements in respect of traffic information to be submitted with this application. This is covered in detail by the Transport Statement (TS), which forms part of this application and should be read in conjunction with this section.

5.30. The proposed scheme seeks permission for a new plastics recycling building, a new digester and the variation of condition to allow the increase in total annual throughput from 30,000 tonnes to 49,000 tonnes.

5.31. The TS seeks to consider the transport impacts of the increase in tonnage and the new plastics building by looking at the methodology utilised in respect of the previous application along with a recent traffic count and weigh bridge receipts to consider whether the figures were robust and whether the increased tonnage would result in harm in highways terms.

CALCULATIONS BASED UPON PREDICTED TRIP RATES USED IN PREVIOUS TS

5.32. The approved planning application for a 30,000 tonne per annum AD plant summarised the traffic movements for the operation to be:

<table>
<thead>
<tr>
<th>Proposed Annual Tonnage</th>
<th>30,000 tonnes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumed average tonnage per load</td>
<td>10 tonnes</td>
</tr>
<tr>
<td>HGV’s per year to service</td>
<td>3000</td>
</tr>
<tr>
<td>Working Year (Less 2 Weeks for Bank Holidays)</td>
<td>50 weeks</td>
</tr>
<tr>
<td>HGV deliveries per week</td>
<td>60 HGV’s</td>
</tr>
<tr>
<td>Working week</td>
<td>5.5 days (Mon-Fri, half day Sat)</td>
</tr>
<tr>
<td>HGV’s Per day</td>
<td>11</td>
</tr>
<tr>
<td>HGV movements per day</td>
<td>22</td>
</tr>
<tr>
<td>HGV movements per hour (0800-1800)</td>
<td>2.2 per hour</td>
</tr>
</tbody>
</table>

5.33. This level of movement was considered acceptable at the time of the application and permission was duly given. The proposed scheme seeks permission to increase the maximum tonnage from 30,000 tonnes per annum to 49,000 tonnes.
per annum along with the construction of a plastics recycling building. Based upon the same methodology the 19,000 tonne increase would result in the following traffic movements:

<table>
<thead>
<tr>
<th>Proposed Annual Tonnage</th>
<th>19,000 tonnes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumed average tonnage per load</td>
<td>10 tonnes</td>
</tr>
<tr>
<td>HGV's per year to service</td>
<td>1900</td>
</tr>
<tr>
<td>Working Year (Less 2 Weeks for Bank Holidays)</td>
<td>50 weeks</td>
</tr>
<tr>
<td>HGV deliveries per week</td>
<td>38 HGV's</td>
</tr>
<tr>
<td>Working week</td>
<td>5.5 days (Mon-Fri, half day Sat)</td>
</tr>
<tr>
<td>HGV’s Per day</td>
<td>7</td>
</tr>
<tr>
<td>HGV movements per day</td>
<td>14</td>
</tr>
<tr>
<td>HGV movements per hour (0800-1800)</td>
<td>1.4 per hour</td>
</tr>
</tbody>
</table>

5.34. Accordingly, based upon the average load of 10 tonnes, the AD plant when operating at its full enlarged capacity if 49,000 tonnes would generate in the region of 36 HGV movements per day with an average of 3.6 movements per hour.

**CALCULATIONS BASED UPON ACTUAL TRAFFIC COUNT DATA**

5.35. The Highways Agency required that a 12 hour traffic count was undertaken at the site access to determine the number of trips generated by the existing AD plant. An independent traffic count was undertaken on the 17th May 2011 and found that between 7am and 7pm there were a total of 53 traffic movements, 33 by car, 18 by LGV/Vans and 2 HGV trips.

5.36. As set out above, it is understood from the applicant that the site is currently operating at 1/3 of its current 30,000 tonne capacity and therefore the observed HGV movements represent only 1/3 of the traffic if the site was operating at its full permitted capacity. The LGV and car movements would not be affected by the scaling of traffic movements.

5.37. If we adjust the measured traffic count to take account of the site working at full capacity then the number of total vehicle movements only increases to 57 with the following breakdown, 33 cars, 18 LGV’s and 6 HGV’s. As can be seen from this only the HGV movements would increase.
5.38. The increase in total annual throughput to 49,000 tonnes is a 63% increase over the approved tonnage, which in addition to the 5 new employees required for the plastics recycling building will result in a total trip generation for the site of 71 total movements, 43 by car, 18 LGV/Van trips and 10 HGV movements.

5.39. As such, the increase in daily traffic movements is generally linear in nature. It should be noted that the increase in the predicted daily HGV movements to a total of 10 HGV trips per day (with 49,000 tonnes capacity) is substantially lower than the 22 predicted HGV trips as provided as part of the previously approved TA for 30,000 tonnes.

**SUMMARY**

5.40. If we compare the predicted traffic movements against the 12 hour measured survey we see that the estimated trip rates provided are robust. To offer further validation to the robustness of the previous TS methodology we have looked at the weighbridge receipts for the week of the measured traffic count, which show the arrival vehicles had an average load of 19.7 tonnes. As such the HGV trip rates based on an assumed 10 tonnes per load are robust compared to the tonnage per load that the existing AD plant is working at.

5.41. The existing access arrangement is therefore considered sufficient to accommodate the small number of additional trips generated by the increase in tonnage and the proposed plastics recycling building.

**ACCIDENT INFORMATION**

5.42. As part of the pre-application discussions with the Highways Agency accident data was required to compare 12 months of data post opening against the 3 years prior to opening to demonstrate that the operation of the junction has not been affected.

5.43. As the site has only been operation from October 2010 we only have 8 months of data post site opening, however the construction work commence November 2009 we have used the comparison period of 3 years prior to the commencement of construction works and data from the construction and operational period. This approach has been agreed with the Highways Agency.
5.44. The data collected and presented within the TS shows that there has been no adverse impact on accident figures as a result of the AD plant at Rothwell Lodge Farm. It is therefore considered that the additional trips generated by the proposed additional digester and plastics recycling building will not have a detrimental impact in terms of highway safety.

**TRANSPORT CONCLUSION**

5.45. In conclusion, there is no reason in highway or transportation terms why the proposed development should not proceed as the development proposals do not have an adverse impact on trip generation from the site and highway safety. Please see the Transport Statement for additional comments.

**LANDSCAPE / VISUAL IMPACT**

5.46. The site already benefits from existing natural screening, either original to the site or enhanced as part of the implementation of the planning permission. There is also a natural bowl to the landform as a result of historic site mineral workings.

5.47. The new building, as shown below, would be of a similar height to that of the existing building and tanks upon the site and feature similar cladding and colour scheme.

5.48. The landscape and visual appraisal which formed part of the previous application upon the site was found by the Council to be a reasonable assessment of the impacts and it was therefore judged that there is no harm to landscape or visual impact arising from the proposals given a similar visual form.
5.49. In respect of this scheme which introduces an additional digestion tank and a new building upon the site we consider that the conclusions reached within the previous application hold firm and the visual impact remains acceptable. However to update the previous summary set out within the Officer’s Report:

- The proposed tank and building would be located adjacent to the existing AD facility and existing farm structures and also adjacent to the A14 and associated service area. The new structures would be positioned within the existing ground levels and within the framework of the existing landform and localised ridgeline. The colour scheme of the cladding would help integrate the appearance of the new buildings into the wider area.

- Existing landscape planting upon the site strengthens existing hedgerows and enhances the vegetated skyline and landscape framework. The proposed scheme would sit within the context of this existing planting and no additional planting would be required.

- In respect of Rothwell Lodge Farm as the closest viewpoint, the proposed tank would be located to the rear of the existing building and the new plastics recycling building located such that it is not readily visible from this property. It is also located adjacent to a bund and existing landscaping along the eastern boundary. This will continue to improve as the planting scheme matures.

- The closest residential property remains Rothwell Lodge Cottages, and views of the site would remain as being restricted to upper floor views only. These would be in the context of the very busy A14 in the foreground. The existing screening reduces views towards the site both from the Cottages and the Farm residence. The proposed tank and building would benefit from the same screening and the same conclusion.

- The restricted views of the site from Rothwell and Thorpe Malsor remain so and while the top of the tank and new building would be visible, they would be lost in the wider landscape and screening once the planting fully establishes itself just like the existing building and tanks upon the site.
The approved planting scheme was found to positively promote wider countryside and landscape objectives. The proposed scheme would not adversely affect these.

5.50. As such it is considered that the proposed development would offer no harm to the visual appearance of the area and would be acceptable in respect of established planning policy.

**NATURAL / HISTORIC ENVIRONMENT**

5.51. In respect of the previous application the archaeological assessment concluded that due to historical mineral workings at the site, no archaeological survival is likely. Therefore no further archaeological work is required. The development would be contained within the existing site area and as such the conclusions reached within the previous application remain valid.

5.52. The site remains distant from the nearest SSSI at Birch Spinney and as such the proposed works will have no impact upon this or any other international or local nature designation.

5.53. The improvements introduced as part of the implementation of the previous application were considered to improve the biodiversity of the existing site. The proposed development would not harm any of the existing or enhanced landscaping and as such the biodiversity of the site would remain as existing and would not be harmed.

**IMPACT ON AGRICULTURAL LAND**

5.54. The land to be used for the stationing of the new digestion tank and the proposed plastics recycling building is upon existing parts of the site which have already been developed.

5.55. As such no additional land would be required and no additional agricultural land taken.

**WATER RESOURCES AND GROUND CONDITIONS**
5.56. The flood risk assessment put forward as part of the previous application concluded that with the inclusion of the proposed design factors, the development represented an insignificant risk of affecting flood risk in the locality. The Environment Agency provided no objection and Condition 27 of the resulting planning permission was duly discharged.

5.57. The site of the new tank would be within an existing bunded area which is impermeable and is designed to accommodate 110% of the contents of the largest tank. As the proposed tank is exactly the same size as the largest tank, the bund remains fit for purpose.

5.58. The site of the proposed plastics recycling building is currently hardstanding, which is impermeable with rain water draining to catchpits, filters and existing soakaways. Oil filters and mechanisms for recycling and reusing dirty water within the AD process are already in place and will be utilised by the proposed building.

5.59. The proposed building would not increase the volume of hardstanding upon the site nor would it increase the volume of rainwater which the existing drainage design would have to accommodate. As such the existing system remains fit for purpose in respect of rain/stormwater provision.

5.60. The use of the proposed building would be for the cleaning and baling up of plastics which enter the site as part of the operation of the AD plant. Normally this waste would go straight to landfill, but the new building would wash and clean the waste plastic such that it can re-enter the waste stream as a product for re-use.

5.61. The washing system would use a lot of water, however existing grey water storage tanks will be used as the primary source of water from the process and only new water used as a last resort. These existing tanks are considered of sufficient size for this task.

5.62. The water coming from the cleaning part of the process will be dirty, but can be integrated back into the AD plant and used in the digestion process as is the current case with used water within the site.

5.63. As such the proposed plastics recycling building will simply integrate with the water recycling systems already in place on site, helping to feed the increased amount of waste proposed to be handled at this facility. No additional hardstanding would be
created and as such the existing systems have been designed to cope with the runoff from the site and therefore do not require alteration or upgrade in this case.

EFFECTS ON LOCAL AMENITY INCLUDING NOISE & ODOUR

5.64. Other than the visual appearance of the building the only other likely impacts of the development upon the amenity of the local area is likely to be noise and odour.

NOISE

5.65. The additional digestion tank will help accommodate this increase in capacity of the operation from 30,000tpa to 49,000tpa. While this is likely to increase the activity of the site, the A14 remains the main source of noise for the nearest residents of Rothwell Lodge Farm and Rothwell Lodge Cottages.

5.66. The proposed plastics recycling building will include the presence of additional machinery, but this is not loud and will be attenuated in line with Condition 10 of the previous permission. The proposed building will feature robust construction and quick close doors and will be able to contain most noise from the plastic recovery process.

5.67. The previous planning permission featured five noise conditions relating to the attenuation of plant and machinery along with setting noise levels for nearby properties. The application of similar conditions to the proposed scheme would ensure the acceptability of the development in noise terms and no harm will result from the proposed development.

ODOUR

5.68. The feedstock for the facility includes food and other organic waste. These materials have the potential to result in nuisance odour. Through the imposition of conditions to the previous permission and through the fine tuning of air filtration settings, the existing operation is not considered to cause a odour issue and has not to this date been the subject of complaint from local residents.
5.69. The increase in operational throughput of the site will increase the amount of waste coming into the site, but the continuation of existing odour restrictions upon the site will there is no adverse impact on amenity resulting from odour is likely to remain minor.

5.70. In respect of the plastics building and odour, while the plastic will be contaminated with waste, the majority will have already been removed so that it can be used in the AD process. Accordingly the potential of the waste plastic to generate odour is considered low.

5.71. In any event it will only be out in the open in the short transit from the main building to the new building. Once inside it may be stored for a brief time, but will quickly enter a cleaning process which will remove any residual food waste and thus any potential for odour.

5.72. All water used in the washing process will be contained in a sealed system and will be returned to the AD process through sealed pipes. As such no issue relating to odour would result from this waste water.

5.73. In summary the proposed development would not result in harm to amenity by way of odour.

CUMULATIVE IMPACT

5.74. There remain no similar facilities within the surrounding area and while the proposed development would increase the amount of waste processed at this site and introduce a building to recover plastics from the waste brought in, the impact of this development has been found to be negligible.

5.75. As such there is considered to be no issue in respect of cumulative impact.
6.0 CONCLUSIONS

6.1. There is an identified need at the local and national level for additional facilities such as this to help lower the amount of waste going to landfill and to aid in the reduction of CO₂. The Coalition Government has also recently set out its commitment to increase the amount of energy derived from waste through anaerobic digestion and to encourage economic growth.

6.2. The proposed scheme would build upon the success of the existing anaerobic digestion operation. By increasing the maximum annual throughput to 49,000 tpa it will help Northamptonshire County Council meet their targets as expressed within the Core Strategy and deliver an additional source of employment.

6.3. The addition of the plastics recycling building is a natural extension of the operation of the site given the amount of plastics which enters the site as part of the waste stream for the anaerobic digestion plant. It will enable the majority of this plastic to be recovered and diverted away from landfill.

6.4. The supplement to PPS1 sets out at Paragraph 40 that an applicant proposing development which contributes to the key planning objectives (providing renewable energy and increasing recycling) should expect expedient and sympathetic handling by the Local Planning Authority.

6.5. This development will help move waste up the waste hierarchy, increase the amount of renewable energy produced and provide additional employment and local growth in line with European, National and Local Policy and we therefore commend the proposals to the Council.
Proposed Plastic Recycling Facility at Rothwell Lodge Farm Kettering Northamptonshire

Site Specific Flood Risk Assessment
Proposed Plastic Recycling Facility
at
Rothwell Lodge Farm
Kettering
Northamptonshire

Site Specific Flood Risk Assessment

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Report Reference  R-FRA-M5605T -02

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Prepared by

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Director

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Company  Name  Issue  Date  Paper  CD  FTP
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Alan Brown, Development Services Ltd  Alan Brown  First  21.06.11  ✔
Fernbrook Bio Ltd  Shaun Cherry  First  21.06.11  ✔
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<td>Sequential test</td>
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<td>5.2</td>
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<td>Conclusions and flood risk from the development</td>
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<td>7</td>
<td>Maintenance</td>
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</table>
### List of Drawings

| M4605T/02/FRA1 | Site Location Plan |
| M4605T/02/FRA2 | Plan showing existing layout and drained area. |
| M4605T/02/FRA3 | Plan showing proposed layout and drained areas |
| M4605T/02/FRA4 | Plan showing overland flow routes |

### List of Appendices

| A | Extract copy of Soiltechnics report including results of infiltration testing |
| B | Overland flow calculations - 4.0m channel |
| C | Overland flow calculations - 10.0m channel |
1.0 Executive summary

1.1 Planning Policy Statement 25 Summary

1.1.1 The following table is based on Planning Policy Statement 25 'practice guide' and serves as an executive summary. This executive summary shall not be read in isolation to the main report that follows.

<table>
<thead>
<tr>
<th>PPS 25 Summary Table</th>
<th>Item</th>
<th>Summary statement</th>
<th>Report ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Development description and location</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1a</td>
<td>What type of development is proposed and where will it be located? Include whether it is new development, an extension to existing development or change of use.</td>
<td>New building and new digestate tank within an existing AD Plant</td>
<td>Section 2.1 Drawing M4605T/02/FRA2</td>
</tr>
<tr>
<td>1b</td>
<td>What is its vulnerability classification?</td>
<td>Less Vulnerable</td>
<td>Section 2.4.2</td>
</tr>
<tr>
<td>1c</td>
<td>Is the proposed development consistent with the local development documents?</td>
<td>Yes, contained within the Northants local waste plan</td>
<td></td>
</tr>
<tr>
<td>1d</td>
<td>Please provide evidence that the sequential test and where necessary the exception test has been applied in the selection of this site for this development type.</td>
<td>Site in flood zone 1 and 2 and classified as less vulnerable, thus sequential test and exception test need not be applied.</td>
<td>Section 4</td>
</tr>
<tr>
<td>2</td>
<td>Definition of the flood hazard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2a</td>
<td>What sources of flooding could affect the site?</td>
<td>None identified</td>
<td>Section 4.1 to 4.4</td>
</tr>
<tr>
<td>2b</td>
<td>For each identified source, describe how flooding would occur, with reference to any historic records wherever these are available.</td>
<td>Not applicable</td>
<td>Sections 4.1 to 4.4</td>
</tr>
<tr>
<td>2c</td>
<td>What are the existing surface water drainage arrangements for the site?</td>
<td>Natural infiltration</td>
<td>Section 6.1.1</td>
</tr>
<tr>
<td>3</td>
<td>Probability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3a</td>
<td>Which flood zone is the site within?</td>
<td>Flood zone 1</td>
<td>Section 4.1 to 4.4</td>
</tr>
<tr>
<td>3b</td>
<td>If there is a Strategic Flood Risk Assessment covering the site what does it show?</td>
<td>Site in Flood Zone 1</td>
<td>Section 4.1</td>
</tr>
<tr>
<td>3c</td>
<td>What is the probability of the site flooding taking account of the contents of the SFRA and of any further site-specific assessment</td>
<td>Site in flood zone 1 and no other sources of flood sources considered to represent a risk identified</td>
<td>Section 4</td>
</tr>
</tbody>
</table>
### 4 Climate Change

| 4a | How is flood risk at the site likely to be affected by climate change? | Industrial development with life unlikely to exceed 45 years, thus stormwater drainage designed for increase in storm intensities of 20% | Section 6.2.6 |

### 5 Detailed development proposals

| 5a | Please provide details of the development layout, referring to the relevant drawings. | Drawings M4605T/02/FRA3 |

| 5b | Where appropriate, demonstrate how land uses most sensitive to flood damage have been placed in areas within the site that are at least risk of flooding. | Not appropriate |

### 6 Flood risk management measures

| 6a | How will the site be protected from flooding, including the potential impacts of climate change, over the development’s lifetime? | Site in flood zones 1, climate change not likely to affect zone classification during the lifetime of the development. |

### 7 Off site impacts

| 7a | How will you ensure that your proposed development and the measures to protect your site from flooding will not increase flood risk elsewhere? | Site in flood zone 1. Stormwater management uses infiltration systems thus replicating existing conditions thus not impacting further on flooding downstream of the site. | Sections 4 and 6 |

| 7b | How will you prevent run-off from the completed development causing impact elsewhere? | Stormwater management of new development will use existing infiltration systems conditions thus not impacting further on flooding downstream of the site. | Section 6 |

### 8 Residual risks

| 8a | What flood related risks will remain after you have implemented the measures to protect the site from flooding? | Overland flows in storm design exceedences, and maintenance / management of the storm water drainage system | Section 6.4 and 7 |

| 8b | How and by whom will these risks be managed over the lifetime of the development? | Development likely to remain in private ownership. Site will be continuously manned and managed following maintenance / operational plans. | Section 7.0 |
1.2 Site Location Plan

Figure 1.2, Site location plan. Approximate site boundary outlined in red. Ariel photograph predates construction of AD plant
2.0 Introduction

2.1 Instructions

2.1.1 This report describes a Site Specific Flood Risk Impact Assessment for a proposed Waste plastic recycling facility and new digestate tank within an existing Anaerobic Digestion Plant at Rothwell in Northamptonshire. The National Grid reference for the site is 482384, 280129. This report has been prepared by JPP Consulting Limited acting on instructions received from Fernbrook Bio Ltd. The benefit of this report is limited to our instructing Client.

2.2 Objectives

2.2.1 The objective of this report is in support of a planning application for the project and to advise interested parties in the development to the potential risk of flooding and management of the plant from a drainage perspective. The report both assesses flood risk and provides a strategy to drain the site in respect of stormwater drainage. The report is not intended as a final design for stormwater drainage, such a design will be subject to more detailed analysis, during the detail design stage.

2.3 Reference documents

2.3.1 This report has been prepared with reference to the following publications:-

- Planning Policy Statement 25 "Development and flood risk" (PPS 25)
- CIRIA Report C624 "Development and flood risk"
- Planning Policy Statement 25 'Practice Guide'
- Environment Agency guidance relating to PPS 25 (FRA Guidance note 1: Development greater than 1Ha in flood zone 1)
- Development and flood risk: a practical guide comparison to PPS 25 "Living Draft"
- Institute of Hydrology (IOH) Report 124 'Flood Estimates for small catchments'
- DTLR 'Preparing for Floods'
- Strategic flood risk assessment report for the area prepared by Royal Haskoning (2005)

2.4 Status of this Report

2.4.1 At this stage we have not directly consulted with the Environment Agency (EA) as we consider the site is not at risk from fluvial flooding, but understand given the size of the existing AD plant which forms the application site (greater than 1Ha) EA standing advice is for the LPA to consult with the EA as part of the planning process.
2.5 Report Distribution

2.5.1 The following table lists parties which will require sight of this report

<table>
<thead>
<tr>
<th>Party</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>For information / reference</td>
</tr>
<tr>
<td>Developer/Contractor/Project Manager</td>
<td>To ensure strategic information on drainage design are implemented and programmed</td>
</tr>
<tr>
<td>Planning department</td>
<td>To support a planning application</td>
</tr>
<tr>
<td>Independent inspectors such as Building Control and Assessors</td>
<td>For compliance with building regulations</td>
</tr>
<tr>
<td>Project design team</td>
<td>To progress the design by taking into consideration strategic information contained in this report</td>
</tr>
<tr>
<td>CDM Coordinator</td>
<td>To advise in construction risk identification and management under the Construction (design and management) regulations</td>
</tr>
</tbody>
</table>

Table 2.5.1
3.0 **Description and History of the site and development Proposals**

3.1 **Location and Description of the Site**

3.1.1 The waste plastic recycling facility will be located within an existing AD plant at Rothwell Lodge farm to the south of Rothwell and south of the A14 Proposals also include an additional Digestate tank within the existing tank farm. The site is positioned on topographically high ground flanking a valley carrying Slade Brook some 500m to the north and a valley containing Thorpe Malsor reservoir located about 500m to the south of the site. A plan showing the location of the site is presented on drawing number M4605/02/T/FRA1.

3.1.2 Existing buildings and associated hardstandings are constructed on reasonably level ground with Digestate storage tanks within an earthworks containment bund. General topographical levels then fall gently to the south towards the outfall from Thorpe Malsor. Buildings, including a two storey house, and a variety of barns forming Rothwell Lodge Farm is located to the north east of the site. The A14 and slip roads providing access to the farm and AD plant generally define northern boundaries of the site.

3.2 **History of the Site**

3.2.1 Inspection of the old Ordnance Survey maps dating back to first editions (1887) indicates the site has not previously developed, but the area was subject to opencast quarrying in the early 1900s for extraction of ironstone. The AD plant was constructed within the last 2 years.

3.3 **Geology of the Site**

3.3.1 Inspection of the geological map of the area (at 1: 10560 and 1:50000 scales) published by the British Geological Survey indicates the topography local to the site is formed in deposits of Northampton Sands, overlying at depth the Upper Lias Clays. The thickness of the Northampton Sands is not recorded at the site but probably is less than 5m. The Upper Lias Clays probably extend to depths exceeding 20m.
3.3.2 The map records the site having being subject to opencast quarrying activities to exploit the iron rich deposits contained in the Northampton Sands. The quarry workings seem to extend, with a reasonable margin, around the southern boundaries of the farm buildings. Typically Quarrying activities were carried out in the early 1900s.

3.3.3 A ground investigation for the AD Plant was carried out at the site by Soiltechnics comprising both boreholes and trial pits. The investigation confirmed the site has been subject to quarrying evidenced by made ground generally comprising loose and medium dense brown and grey silts and silty sands with varying concentrations of sandstone gravels, cobbles and boulders, typical of original weathered (and none iron containing) Northampton sands which would have formed overburden to the quarry. Typically these soils will have been deposited into the worked out quarry excavation without compaction. Some of the exploratory excavations in the north eastern extremity of the AD site encountered naturally deposited Northampton Sands.

3.3.4 Infiltration testing was carried out in a number of trial pits indicating soils in the northern half of the site exhibited permeability in the order of $10^{-5}$ m/s, however soils generally in the southern part of the site contained elevated concentrations of fine grained soils which significantly reduced permeability. Extract copies of Soiltechnics report with permeability test results are presented in appendix A. Laboratory testing has also been carried out at the site to measure concentrations of common chemical contaminants, to establish the need (if any) for remedial works to render the site fit for purpose. The results of the investigation essentially concluded that no remedial works are required with respect to chemical contamination, and leachate values indicate infiltration systems are unlikely to mobilise contaminants.

3.4 **Development Proposals and Flood Risk Vulnerability**

3.4.1 Proposals are to construct a building to house waste plastic recycling plant. Essentially the building footprint will occupy existing hardstanding areas. An additional Digestate tank is also proposed within the existing containment bund. A plan showing the general plant layout is presented on drawing M4605T/02/FRA3.

3.4.2 With reference to Table D2 of PPS 25, the proposed development would be classified as "Less Vulnerable" (Waste treatment plants). A copy of Table D2 is provided below with the development type highlighted.
### Flood Risk Vulnerability Classification

<table>
<thead>
<tr>
<th>Vulnerability</th>
<th>Development types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Infrastructure</td>
<td>Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk, and strategic utility infrastructure, including electricity generating power stations and grid and primary substations.</td>
</tr>
<tr>
<td>Highly Vulnerable</td>
<td>Police stations, Ambulance stations and Fire stations and Command Centres and telecommunications installations required to be operated during flooding. Emergency dispersal points. Basement Dwellings. Caravans, mobile homes and park homes intended for residential use. Installations requiring hazardous substances consent.</td>
</tr>
<tr>
<td>More Vulnerable</td>
<td>Hospitals. Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs and hotels. Non-residential uses for health services, nurseries and educational establishments. Landfill and sites used for waste management facilities for hazardous waste. Sites used for holiday short-let caravans and camping, subject to a specific warning and evacuation plan.</td>
</tr>
<tr>
<td>Less Vulnerable</td>
<td>Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non-residential institutions not included in “more vulnerable”; and assembly and leisure. Land and buildings used for agriculture and forestry. Waste treatment (except landfill and hazardous waste facilities). Mineral working and processing (except sand and gravel working). Water treatment plants. Sewerage treatment plants (if adequate pollution control measures are in place).</td>
</tr>
<tr>
<td>Water-Compatible Development</td>
<td>Flood control infrastructure. Water transmission infrastructure and pumping stations. Sewerage transmission infrastructure and pumping stations. Sand and Gravel workings. Docks, marinas and wharves. Navigation facilities MOD defence installations. Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. Water-based recreation (excluding sleeping accommodation). Lifeguard and coastal stations. Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. Essential ancillary sleeping or residential accommodation for staff required for used in this category, subject to a specific warning and evacuation plan.</td>
</tr>
</tbody>
</table>

Table D2
4.0 Flood risk

4.1 Fluvial / Tidal flooding

4.1.1 We have visited the Environment Agency website to view their flood risk maps. A copy of the EA flood risk map is presented below:

- Extract copy of flood risk map
- Areas at flood risk shaded blue
- Map obtained from Envirocheck and based on EA maps
- Site boundaries outlined in red

The flood risk map indicates the site is remote from areas deemed at risk of fluvial flooding. In accordance with PPS 25 this site is situated in flood zone 1 (Low Probability) with an annual probability of flooding of less than 1 in 1000 in any year (<0.1%). A copy of table D1 in PPS25 is presented below and defines flood zone 1.

<table>
<thead>
<tr>
<th>Flood Zone</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1:</td>
<td></td>
</tr>
<tr>
<td>Low Probability</td>
<td>This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (&lt;0.1%)</td>
</tr>
<tr>
<td>Zone 2:</td>
<td></td>
</tr>
<tr>
<td>Medium Probability</td>
<td>This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year</td>
</tr>
<tr>
<td>Zone 3a</td>
<td></td>
</tr>
<tr>
<td>High Probability</td>
<td>This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (&lt;1%) or a 1 in 200 or greater annual probability of flooding from the sea (&lt;0.5%) in any year</td>
</tr>
<tr>
<td>Zone 3b</td>
<td></td>
</tr>
<tr>
<td>The Functional Flood plain</td>
<td>This zone comprises land where water has to flow or be stored in times of flood. SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes</td>
</tr>
</tbody>
</table>

Table 4.1.4
The Environment Agency Flood Map does not indicate the site is at risk from tidal flooding.

4.1.2 We have also reviewed a strategic flood risk assessment of the area produced by Royal Haskoning. The report essentially confirms the site is located in flood zone 1.

4.2 Flooding from Groundwater

4.2.1 The site is predominantly underlain with made ground deposits overlying Upper Lias Clays which are considered to be impermeable soils. None of the Exploratory excavations extending to depths of up to 3m encountered groundwater, however the Groundwater vulnerability map (extract copy presented below) indicates the site is located within an area designated a minor aquifer. This probably reflects the local geology comprising relatively permeable deposits of the Northampton Sands as they overly the relatively impermeable Lias Clays. Clearly past quarrying activities will have affected the original aquifer conditions, however groundwater is still likely to remain in basal deposits of the made ground / Lias Clay interface in excess of 3m below the site.

![Extract copy of groundwater vulnerability map](image)

- Dark brown shading represents minor aquifer
- Site boundaries outlined in red

We consider the risk from groundwater flooding affecting the site to be negligible

4.3 Flooding from Sewers

4.3.1 We have consulted Anglian Water Services and there are no sewers operated by them in proximity to the site.

4.3.2 We have no records of the A14 highway drainage to the north of the site. From site inspections, it would seem the drainage follows a route to the north of the site presumably directing stormwater to the Slade Brook catchment, thus away from the subject site.
4.3.3 Based on a preliminary inspection of stormwater systems serving the adjacent farm, the stormwater seems to be disposed of using soakaways. Foulwater from the farmhouse is directed to a septic tank which is topographically situated down slope of the site but within the farm complex.

4.3.4 Based on the above, it is considered that the site is unlikely to be at risk of flooding from sewers.

4.4 Flooding from Reservoirs, Canals and other Artificial Sources

4.4.1 We are not aware of any canals or artificial sources that may result in flooding of this site. Thorpe Malsor reservoir is located about 500m to the south of the site, but at a substantially lower topographical level. On this basis it is considered that the site is unlikely to be at risk of flooding from artificial sources.

4.5 Flood Risk Vulnerability and Flood Zone Compatibility

4.5.1 Based on the above assessment of Flood Risk (Zone 1) and development vulnerability (less vulnerable) and with reference to PPS 25 Table D3 the proposed development of this site would be considered "appropriate". A copy of table D3 is presented below highlighting the above.

<table>
<thead>
<tr>
<th>Flood Risk Vulnerability and Flood Zone Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood Risk Vulnerability classification</td>
</tr>
<tr>
<td>Zone 1</td>
</tr>
<tr>
<td>Zone 2</td>
</tr>
<tr>
<td>Zone 3a</td>
</tr>
<tr>
<td>Zone 3b</td>
</tr>
</tbody>
</table>

✔ = Development is appropriate  X = Development should not be permitted

Table 4.5.1
5.0 Sequential and Exception tests

5.1 Sequential test.

5.1.1 Following PPS 25 (paragraphs 16 and 17), it is the responsibility of the local planning authority (LPA) to apply the sequential test to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding. As this site is within flood zones 1 and thus at minimal risk of fluvial flooding, we consider there is no need to apply the sequential test with respect to this site in relation to flood risk.

5.2 Exception test.

5.2.1 Following table D2 of PPS 25, with the site located in flood zone 1, and deemed a ‘less vulnerable’ development, the development is considered ‘appropriate’, and thus an exception test is not required.
6.0 Management of surface water

6.1 Current conditions

6.1.1 Hardened areas of the existing AD plant are drained into soakaways in accordance with the site specific flood risk assessment report produced to support the planning application for the AD plant in 2009, which received planning on 22nd October 2009 (planning ref KET/2009/0295). The soakaway systems will continue to be used and will accommodate the new building as the hardened and drained area will not be changed.

6.2.6.1 The original soakaways have been designed to accommodate storms up to the 1 in 100 year event and allow for increase in storm intensities up to 20% (design life of ‘industrial’ developments assumed at less than 45 years), thus following the requirements of PPS 25 annex B. A copy of table B8.2 is presented below.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1990 to 2025</th>
<th>2025 to 2055</th>
<th>2055 to 2085</th>
<th>2085 to 2115</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak rainfall Intensity</td>
<td>+5%</td>
<td>+10%</td>
<td>+20%</td>
<td>+30%</td>
</tr>
<tr>
<td>Peak river Flow</td>
<td>+10%</td>
<td>+20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offshore Wind speed</td>
<td>+5%</td>
<td>+10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extreme Wave height</td>
<td>+5%</td>
<td>+10%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6.2.6.1

6.2.7.1 Proposals are to collect roofwater from the proposed building and convey stormwater into the nearby soakaway network via a short subsurface piped drainage system. Drawing M4605T/02/FRA3 attached outlines the drainage route.

6.4 Overland flows

6.4.1 The existing stormwater drainage system accommodates the 1 in 100 year storm event taking into account the predicted future effects of global warming (20% increase in intensity). Clearly there is a risk of this storm event being exceeded, albeit this risk is considered very low. In such an event the proposed drainage systems will become overwhelmed and overland flows (outside the tank farm) could occur.

6.4.2 The access road to the media area forms part of the tank farm bund, and will be higher than the level at the entrance to the site, and so outside the tank farm, overland flows will be towards the north eastern corner of the site (road entrance). From this point natural ground levels fall in a south easterly direction.
6.4.3

We have modelled the overland flows for exceedance conditions (exceeding the 1 in 100 year event) using Microdrainage WinDes software. The topography of the overland flow route shown on drawing M4605T/02/FRA4, exhibits a reasonably vertical fall (average 1 in 40 based on Ordnance Survey contour map data), but the channel width is difficult to define as the topography is reasonably uniform along contour lines. In order to produce a model we have adopted a very constrained channel profile which in our opinion is very pessimistic, and considered two channels of 4m and 10m width to allow a sensitivity analysis to be performed. In reality the channel profile will be much greater than this and will result in much shallower flow depths than those modelled. The model generates a 1 in100 year storm event peak flow rate of some 1.26m$^3$/s and for a 200 year storm approximately 1.47m$^3$/s. This analysis also produces peak depths of flow in the channel sections, and thus allows velocities to be calculated.

<table>
<thead>
<tr>
<th>Channel width</th>
<th>100 year Flow depth</th>
<th>200 year Flow depth</th>
<th>Difference in Flow depth</th>
<th>Peak flow velocity</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0m</td>
<td>0.145m</td>
<td>0.159m</td>
<td>0.014m</td>
<td>3.75m/s</td>
</tr>
<tr>
<td>10.0m</td>
<td>0.084m</td>
<td>0.092m</td>
<td>0.008m</td>
<td>2.63m/s</td>
</tr>
</tbody>
</table>

The above analysis assumes that the entire site area is contributing to the overland flows, as could be the case if the entire surface water drainage system were to be completely inundated, though realistically it is reasonable to assume that flow rates would be partially reduced by infiltration, thereby also reducing flow velocities. With reference to Flood Risk Assessment Guidance for New Development (FD2320/TR2), Table 13.1 ‘Danger to people for different combinations of depth and velocity’, the overland flows from the site will be sufficiently shallow and slow that they may considered ‘very low hazard’. A copy of Table 13.1 is presented below. It should be recognised at this stage the overland flow path follows open grazing land.
6.4.4 Both the car park and main service yard will also be at higher levels than the site entrance, and therefore access routes and working areas for emergency services will not become flooded even in circumstances during which the capacity of the stormwater drainage system is exceeded.

6.4.5 Within the tank farm bund, the invert of the bund will fall towards the centre of the bund and subsequently outfall into infiltration trenches. In severe storm events (exceeding the 100 year event) the infiltration trenches will become overwhelmed and water will back up into the bund. In such an event water will have to be pumped from the bunded area and discharged to the north of the site to join other overland flows generated by the site. Pumping will have to be carried out to maintain the volume capacity of the bunded area in case of a tank failure, with pumping manually implemented by staff on site and the requirement incorporated into site operational procedures. An appropriate pump and hoses will be kept on site.

6.5 **Foulwater drainage strategy**

6.5.1 Foulwater generated by the new build will be limited to domestic type toilet / wash facilities and excess water from a wheel wash facility which will incorporate a water recycling plant. We are advised that the plant will accommodate this...
foulwater in the general anaerobic digestion process, thus there will be no requirements for other form of treatment and effluent discharge on site.

6.6 Conclusions and flood risk from site drainage proposals

6.6.1 Based on the above, providing the above strategies are adopted the proposed building will not further contribute to further flood risk in ultimate receiving watercourses downstream of the site, thus satisfying the principles of PPS 25
7.0 Maintenance

7.1 The drainage system serving the AD plant has been designed to minimise maintenance requirements, and the drainage system for the waste plastic recycling building will also be designed to minimise maintenance. The drainage maintenance scheme for the new building will be incorporated into the maintenance scheme for the AD plant. The plant will remain in private ownership but regulated by the appropriate authorities. The AD plant is manned at all times, and maintenance crews / companies are appointed to implement such works. The AD plant operates under an Environmental Permit, requiring environmental monitoring during operation of the plant.
Appendix A

Extract copy of Soiltechnics report including results of infiltration testing
**Brief soil description and strata of Soakaway SA101:**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>LEGEND</th>
<th>DEPTH (m)</th>
<th>SAMPLE DEPTH/TYPE</th>
<th>TIME (mins)</th>
<th>DEPTH TO WATER (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass onto brown sandy gravelly SILT, gravel consists of ferruginous limestone (TOP SOIL)</td>
<td>0.0</td>
<td>0.0</td>
<td>2.4</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Loose brown becoming orange brown clayey silty SAND and GRAVEL, gravel consists of ferruginous limestone (MADE GROUND)</td>
<td>0.3</td>
<td>10</td>
<td>2.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium dense orange brown very clayey sandy some cobbles SILT AND GRAVEL, gravel and cobbles consists of ferruginous limestone (MADE GROUND)</td>
<td>1.45</td>
<td>50</td>
<td>2.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial pit terminated at 2.75m</td>
<td>2.75</td>
<td>210</td>
<td>2.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Trial pit sides unstable between 1.45 and 2.75m widening the pit by 0.3m.
2. No groundwater encountered.
3. Infiltration test undertaken between 2.4m-2.75m.

**Calculations: TP101**

Soil infiltration rate, $f = \frac{V_{p75 - 25}}{d_{p75} \times t_{p75 - 25}}$

where: $V_{p75 - 25}$ = effective storage volume of water in the trial pit between 75% ($d_{p75}$) and 25% ($d_{p25}$) effective depth = $(d_{p75} - d_{p25}) \times \text{width} \times \text{breadth}$

$= (2.55 - 2.45) \times 0.6 \times 2.0 = 0.12m^2$

$d_{p75}$ = the internal surface area of the trial pit up to 50% effective depth and including the base area; $d_{p75} = (d_{p75} - d_{p25}) \times (\text{width} + \text{breadth}) \times 2 + (\text{width} \times \text{breadth})$

$= (2.55 - 2.45) \times (0.6 + 2.0) \times 2 + (0.6 \times 2.0) = 1.72m^2$

$t_{p75 - 25}$ = the time for the water level to fall from 75% to 25% effective depth = 160 - 61 = 99 (mins)

$= 99 \times 60 = 5940$ (seconds)

therefore:

$f = \frac{0.12}{1.72 \times 5940} = 1.17 \times 10^{-4} \text{ m/s}$

**Trial pit details: TP101**

- Ground level: 48.6m
- Method of excavation: JCB-3CX
- Date of excavation: 13.03.09
- Location plan reference: D-STE1362W-101
- Grid Reference: 482445,280160

**Trial pit depths/dimensions:**

- Depth of trial pit at start of test: 2.75m
- Depth to water at start of test: 2.4m
- Trial pit width: 0.6m
- Trial pit breadth: 2.0m
- Trial pit depth at completion of test: 2.75m
# SOIL INFILTRATION TEST

**Project:** Rothwell Lodge Farm. Proposed Anaerobic Plant.

**Date:** 16.03.09

**Title:** SOIL INFILTRATION TEST (generally in accordance with Building Research Establishment Digest 365 2007).

**Brief soil description and strata of Soakaway SA102:**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>LEGEND</th>
<th>DEPTH (m)</th>
<th>SAMPLE DEPTH/TYPE</th>
<th>TIME (mins)</th>
<th>DEPTH TO WATER (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass onto brown sandy gravelly SILT, gravel consists of ferruginous limestone (TOP SOIL)</td>
<td></td>
<td>0.0</td>
<td></td>
<td>0</td>
<td>1.2</td>
</tr>
<tr>
<td>grading into Loose brown becoming orange brown clayey silty SAND and GRAVEL, gravel consists of ferruginous limestone (MADE GROUND)</td>
<td></td>
<td>0.4</td>
<td></td>
<td>0.5</td>
<td>1.28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.1</td>
<td></td>
<td>1.5</td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.35</td>
<td></td>
<td>2</td>
<td>1.35</td>
</tr>
</tbody>
</table>

**Trial pit terminated at 1.35m**

**Notes:**
1) Trial pit sides unstable between 0.7 and 1.35m widening the pit by 0.2m.
2) No groundwater encountered.
3) Infiltration test undertaken between 1.1m-1.35m.

### Calculations: TP102

**Soil infiltration rate,**

\[ f = \frac{V_{p75\text{-}25}}{d_{p75} \times t_{75\text{-}25}} \]

where:
- \( V_{p75\text{-}25} \) = effective storage volume of water in the trial pit between 75% \((d_{p75})\) and 25% \((d_{p25})\) effective depth = \((d_{p75} - d_{p25}) \times \text{width} \times \text{breadth} \)
  \[ (1.3125 - 1.2375) \times 0.6 \times 1.5 = 0.0675 \text{m}^3 \]
- \( a_{p70} \) = the internal surface area of the trial pit up to 50% effective depth and including the base area; = \((d_{p70} - d_{p25}) \times (\text{width} + \text{breadth}) \times 2 + (\text{width} \times \text{breadth}) \)
  \[ (1.3125 - 1.2375) \times (0.6 + 1.5) \times 2 + (0.6 \times 1.5) = 1.215 \text{m}^2 \]
- \( t_{75\text{-}25} \) = the time for the water level to fall from 75% to 25% effective depth = 1.22 – 0.22 = 1 (min)
  \[ = 1 \times 60 = 60 \text{ (seconds)} \]

**Therefore:**

\[ f = \frac{0.0675}{1.215 \times 60} = 9.26 \times 10^{-4} \text{ m/s} \]

(Two additional cycles were attempted however, a sufficient head of water could not be formed to allow measurement)

**Plot showing time against depth to water:**

**Trial pit details: TP102**

- Ground level: 48.6m
- Method of excavation: JCB-3CX
- Date of excavation: 13.03.09
- Location plan reference: D-STE1362W-101
- Grid Reference: 482441,280169

**Trial pit depths/dimensions:**

- Depth of trial pit at start of test: 1.35m
- Depth to water at start of test: 1.25m
- Trial pit width: 0.6m
- Trial pit breadth: 1.5m
- Trial pit depth at completion of test: 1.35m

---

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Brief soil description and strata of Soakaway SA103:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>DEPTH (m)</th>
<th>TIME (mins)</th>
<th>DEPTH TO WATER (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass onto brown sandy gravelly SILT, gravel consists of ferruginous limestone (TOP SOIL)</td>
<td>0.0</td>
<td>0</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14</td>
<td>1.41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>154</td>
<td>1.42</td>
</tr>
<tr>
<td>Loose buff brown grey mottled orange sandy gravelly clayey SILT, gravel consists of mudstone (MADE GROUND)</td>
<td>0.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loose grey orange brown sandy gravelly very clayey SILT, gravel and cobbles consists of ferruginous limestone (MADE GROUND)</td>
<td>1.45</td>
<td></td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>1.65</td>
<td></td>
<td>1.45</td>
</tr>
<tr>
<td>TRIAL PIT TERMINATED AT 1.65m</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1) Trial pit sides remained upright and stable.
2) No groundwater encountered.
3) Infiltration test undertaken between 1.4m-1.65m.

Test observations:

**Calculation: TP103**

Soil infiltration rate, \( f = \frac{V_{75-25}}{d_{75-25} \times t_{75-25}} \)

where:
- \( V_{75-25} \) = effective storage volume of water in the trial pit between 75% (\( d_{75} \)) and 25% (\( d_{25} \)) effective depth = \((d_{75} - d_{25})\times \text{width} \times \text{breadth} = (1.415 - 1.405) \times 0.6 \times 1.5 = 0.099\text{m}^3\)
- \( d_{75} \) = the internal surface area of the trial pit up to 50% effective depth and including the base area; = \((d_{75} - d_{25})\times (\text{width} + \text{breadth}) \times 2 + (\text{width} \times \text{breadth}) = (1.415 - 1.405) \times (0.6 + 1.5) \times 2 + (0.6 \times 1.5) = 0.942\text{m}^2\)
- \( t_{75-25} \) = the time for the water level to fall from 75% to 25% effective depth = 76.5 - 2 = 74.5 (mins) = 74.5 \times 60 = 4470 \text{seconds}\)

therefore:

\( f = \frac{0.099}{0.942 \times 4470} = 2.1 \times 10^{-4} \text{m/s} \)
**Brief soil description and strata of Soakaway SA104: Cycle 1**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>LEGEND</th>
<th>DEPTH (m)</th>
<th>SAMPLE DEPTH/TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass onto brown sandy gravely SILT, gravel consists of ferruginous limestone (TOP SOIL)</td>
<td>0.0</td>
<td>0</td>
<td>1.8</td>
</tr>
<tr>
<td>grading into Loose orange brown very clayey some cobbles SAND and GRAVEL, gravel and cobbles consists of ferruginous limestone (NORTHAMPTON SAND)</td>
<td>0.4</td>
<td>1</td>
<td>1.9</td>
</tr>
</tbody>
</table>

**Trial pit terminated at 1.9m**

**Notes**
1) Trial pit sides unstable between 0.5 and 1.9m widening the pit by 0.3m.
2) No groundwater encountered.
3) Infiltration test undertaken between 1.8m-1.9m.

**Calculations: TP104**

Soil infiltration rate, \( f = \frac{V_{p75-25}}{a_{p75} \times t_{p75-25}} \)

where: 
- \( V_{p75-25} \) = effective storage volume of water in the trial pit between 75% \( (d_{p75}) \) and 25% \( (d_{p25}) \) effective depth = \( (d_{p75} - d_{p25}) \) x width x breadth 
  \( (1.875 - 1.825) \times 0.6 \times 2.0 = 0.06 \text{m}^3 \)
- \( a_{p75} \) = the internal surface area of the trial pit up to 50% effective depth and including the base area: \( = (d_{p75} - d_{p25}) \times (\text{width} + \text{breadth}) \times 2 + (\text{width} \times \text{breadth}) \) 
  \( (1.875 - 1.825) \times (0.6 + 2.0) \times 2 + (0.6 \times 2.0) = 1.46 \text{m}^2 \)
- \( t_{p75-25} \) = the time for the water level to fall from 75% to 25% effective depth = 1.5 – 0.5 = 1 (min) 
  \( = 1 \times 60 = 60 \text{ (seconds)} \)

therefore:

\[ f = \frac{0.06}{1.46 \times 60} = 6.85 \times 10^{-4} \text{ m/s} \]
**Project Ref:** STD1362W  
**Scale:** N/A  
**Checked by:** [Signature]  
**Drawn by:** MDH  
**Appendix:** **

**Project:** Rothwell Lodge Farm.  
**Proposed Anaerobic Plant.**  
**Date:** 16.03.09

**Title:** SOIL INFILTRATION TEST (generally in accordance with Building Research Establishment Digest 365 2007).

**Brief soil description and strata of Soakaway SA104: Cycle 2**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>LEGEND</th>
<th>DEPTH (m)</th>
<th>TIME (mins)</th>
<th>DEPTH TO WATER (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass onto brown sandy gravelly SILT, gravel consists of ferruginous limestone (TOP SOIL)</td>
<td></td>
<td>0.0</td>
<td>0</td>
<td>1.8</td>
</tr>
<tr>
<td>grading into</td>
<td></td>
<td>0.4</td>
<td>1</td>
<td>1.85</td>
</tr>
<tr>
<td>Loose orange brown very clayey some cobbles SAND and GRAVEL, gravel and cobbles consists of ferruginous limestone (MADE GROUND)</td>
<td></td>
<td>1.4m D</td>
<td>2</td>
<td>1.9</td>
</tr>
</tbody>
</table>

**TRIAL PIT TERMINATED AT 1.9m**

**Notes**

1. Trial pit sides unstable between 0.5 and 1.9m widening the pit by 0.3m.
2. No groundwater encountered.
3. Infiltration test undertaken between 1.8m-1.9m.

**Calculations: TP104**

Soil infiltration rate, \( f = \frac{V_{75 - 25}}{a_{p25} \times t_{75 - 25}} \)

where:  
\[ V_{75 - 25} = \text{effective storage volume of water in the trial pit between 75\% (}d_{75}\text{) and 25\% (}d_{25}\text{) effective depth} = (d_{75} - d_{25}) \times \text{width} \times \text{breadth} = (1.875 - 1.825) \times 0.6 \times 2.0 = 0.06 m^3 \]

\[ a_{p25} = \text{the internal surface area of the trial pit up to 50\% effective depth and including the base area} = (d_{p25} - d_{25}) \times (\text{width} \times \text{breadth}) = (1.875 - 1.825) \times (0.6 \times 2.0) = 1.46 m^2 \]

\[ t_{75 - 25} = \text{the time for the water level to fall from 75\% to 25\% effective depth} = 1.5 \times 0.5 = 1 \text{ (min)} = 1 \times 60 = 60 \text{ (seconds)} \]

Therefore:

\[ f = \frac{0.06}{1.46 \times 60} = 6.85 \times 10^{-4} m/s \]

**Graph:** Plot showing time against depth to water.

**Trial pit details: TP104**

- **Ground level:** 49.3m
- **Method of excavation:** JCB-3CX
- **Date of excavation:** 13.03.09
- **Location plan reference:** D-STE1362W-101
- **Grid Reference:** 482403,280221

**Trial pit depths/dimensions:**

- Depth of trial pit at start of test: 1.9m
- Depth to water at start of test: 1.8m
- Trial pit width: 0.6m
- Trial pit breadth: 2.0m
- Trial pit depth at completion of test: 1.9m

**Trial pit observations:**

- Grass onto brown sandy gravelly SILT, gravel consists of ferruginous limestone (TOP SOIL)
- grading into
- Loose orange brown very clayey some cobbles SAND and GRAVEL, gravel and cobbles consists of ferruginous limestone (MADE GROUND)

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**Brief soil description and strata of Soakaway SA105: Cycle 1**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>LEGEND</th>
<th>DEPTH (m)</th>
<th>SAMPL DEPTH</th>
<th>TIME (mins)</th>
<th>DEPTH TO WATER (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass onto brown sandy gravelly SILT, gravel consists of ferruginous limestone (TOP SOIL)</td>
<td></td>
<td>0.0</td>
<td></td>
<td>0</td>
<td>1.75</td>
</tr>
<tr>
<td>grading into Loose brown becoming orange brown clayey silty SAND and GRAVEL, gravel consists of ferruginous limestone (MADE GROUND)</td>
<td></td>
<td>0.4</td>
<td></td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td>Medium dense orange brown very clayey silty some cobbles SAND AND GRAVEL, gravel and cobbles consists of ferruginous limestone (MADE GROUND)</td>
<td></td>
<td>1.2</td>
<td></td>
<td>2.1</td>
<td>2.0m D</td>
</tr>
</tbody>
</table>

**Notes**
1) Trial pit sides unstable between 0.9 and 2.1m widening the pit by 0.3m.
2) No groundwater encountered.
3) Infiltration test undertaken between 1.75m-2.1m.

**Trial pit details: TP105**
- Ground level: 49.8m
- Method of excavation: JCB-3CX
- Date of excavation: 13.03.09
- Location plan reference: D-STE1362W-101
- Grid Reference: 482356,280199

**Trial pit depths/dimensions**
- Depth of trial pit at start of test: 2.1m
- Depth to water at start of test: 1.75m
- Trial pit width: 0.6m
- Trial pit breadth: 1.5m
- Trial pit depth at completion of test: 2.1m

**Calculations: TP105**

Soil infiltration rate, \( f = \frac{V_{75 - 25}}{a_{p75} \times t_{75 - 25}} \)

where: \( V_{75 - 25} \) = effective storage volume of water in the trial pit between 75% \((d_{p75})\) and 25% \((d_{p25})\) effective depth = \((d_{p75} - d_{p25}) \times \text{width} \times \text{breadth} = (2.0125 - 1.8375) \times 0.6 \times 1.5 = 0.105m^3 \)

\( a_{p70} \) = the internal surface area of the trial pit up to 50% effective depth and including the base area = \((d_{p70} - d_{p25}) \times (\text{width} + \text{breadth}) \times 2 + (\text{width} \times \text{breadth}) = (2.0125 - 1.8375) \times (0.6 + 1.5) \times 2 + (0.6 \times 1.5) = 1.635m^2 \)

\( t_{75 - 25} \) = the time for the water level to fall from 75% to 25% effective depth = 2.15 - 0.6 = 1.55 (mins)

therefore:

\( f = \frac{0.105}{1.635 \times 93} = 6.9 \times 10^{-4} \text{m/s} \)
**Brief soil description and strata of Soakaway SA105: Cycle 2**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>LEGEND</th>
<th>DEPTH (m)</th>
<th>SAMPLE DEPTH/TYPE</th>
<th>TIME (mins)</th>
<th>DEPTH TO WATER (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass onto brown sandy gravelly SILT, gravel consists of ferruginous limestone (TOP SOIL)</td>
<td></td>
<td>0.0</td>
<td></td>
<td>0</td>
<td>1.8</td>
</tr>
<tr>
<td>Loose brown becoming orange brown clayey silty SAND and GRAVEL, gravel consists of ferruginous limestone (MADE GROUND)</td>
<td></td>
<td>0.4</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Medium dense orange brown very clayey silty some cobbles SAND AND GRAVEL, gravel and cobbles consists of ferruginous limestone (MADE GROUND)</td>
<td></td>
<td>1.2</td>
<td></td>
<td>2</td>
<td>2.1</td>
</tr>
</tbody>
</table>

**Test observations:**

- Trial pit terminated at 2.1m
- Notes:
  1. Trial pit sides unstable between 0.9 and 2.1m widening the pit by 0.3m.
  2. No groundwater encountered.
  3. Infiltration test undertaken between 1.75m-2.1m.

**Calculations: TP105**

Soil infiltration rate, \( f = \frac{V_{75-25}}{a_{p75} \times t_{75-25}} \)

where:
- \( V_{75-25} \) = effective storage volume of water in the trial pit between 75% \( (d_{p75}) \) and 25% \( (d_{p25}) \) effective depth = \( (d_{p75} - d_{p25}) \times \) width \( \times \) breadth
- \( a_{p70} \) = the internal surface area of the trial pit up to 50% effective depth and including the base area; = \( (d_{p70} - d_{p25}) \times (\text{width} + \text{breadth}) \times 2 + (\text{width} \times \text{breadth}) \)
- \( t_{75-25} \) = the time for the water level to fall from 75% to 25% effective depth = \( 2.15 - 0.6 = 0.74 \) (mins)

\[ f = \frac{0.135}{0.5103 \times 44.4} = 5.9 \times 10^{-3} \text{ m/s} \]
**SOIL INFILTRATION TEST** (generally in accordance with Building Research Establishment Digest 365 2007).

**Brief soil description and strata of Soakaway SA106:**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>LEGEND</th>
<th>DEPTH (m)</th>
<th>SAMPLE DEPTH/TYPE</th>
<th>TIME (mins)</th>
<th>DEPTH TO WATER (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass onto brown sandy gravelly SILT, gravel consists of ferruginous limestone (TOP SOIL)</td>
<td></td>
<td>0.0</td>
<td></td>
<td>0</td>
<td>2.4</td>
</tr>
<tr>
<td>Loose buff brown grey mottled orange sandy gravelly silty CLAY, gravel consists of mudstone (MADE GROUND)</td>
<td></td>
<td>0.3</td>
<td></td>
<td>20</td>
<td>2.4</td>
</tr>
</tbody>
</table>

**Trial pit terminated at 2.7m**

Notes:
1) Trial pit sides remained upright and stable.
2) No groundwater encountered.
3) Infiltration test undertaken between 2.4m-2.7m.

**Calculations: TP106**

Soil infiltration rate, \( f = \frac{C_{v,25} - C_{v,75}}{a_{25} \times t_{p,75 - 25}} \)

where:

\( C_{v,25} - C_{v,75} \) = effective storage volume of water in the trial pit between 75% \((d_{p,75})\) and 25% \((d_{p,25})\) effective depth = \((d_{p,75} - d_{p,25}) \times \text{width} \times \text{breadth}\)

\( a_{25} \) = the internal surface area of the trial pit up to 50% effective depth and including the base area; \= \((d_{p,75} - d_{p,25}) \times \text{(width + breadth)} \times 2 + \text{(width \times breadth)}\)

\( t_{p,75 - 25} \) = the time for the water level to fall from 75% to 25% effective depth

therefore:

**NO INFILTRATION IN TRIAL PIT SA106**

**Plot showing time against depth to water:**

**Trial pit details: TP106**

- Ground level: 47.6m
- Method of excavation: JCB-3CX
- Date of excavation: 13.03.09
- Location plan reference: D-STE1362W-101
- Grid Reference: 482330,280138
- Depth of trial pit at start of test: 2.7m
- Depth to water at start of test: 2.4m
- Trial pit width: 0.6m
- Trial pit breadth: 2.25m
- Trial pit depth at completion of test: 2.7m

**Trial pit depths/dimensions:**

- Depth of trial pit at start of test: 2.7m
- Depth to water at start of test: 2.4m
- Trial pit width: 0.6m
- Trial pit breadth: 2.25m
- Trial pit depth at completion of test: 2.7m

---

**C e d a r  B a r n ,  W h i t e  L o d g e ,  W a l g r a v e ,  N o r t h a m p t o n .  N N 6  9 P Y .**

**T e l :  ( 0 1 6 0 4 )  7 8 1 8 7 7  F a x :  ( 0 1 6 0 4 )  7 8 1 0 0 7  E - m a i l :  m a i l @ s o i l t e c h n i c s . n e t**

**www.soiltechnics.net**
**Project:** Rothwell Lodge Farm. Proposed Anaerobic Plant.

**Title:** SOIL INFILTRATION TEST (generally in accordance with Building Research Establishment Digest 365 2007).

**Calculations: TP107**

Soil infiltration rate, \( f = \frac{V_{p75-25}}{a_{pit} \times t_{p75-25}} \)

where: 
- \( V_{p75-25} \) = effective storage volume of water in the trial pit between 75% (\( d_{p75} \)) and 25% (\( d_{p25} \)) effective depth = \((d_{p75} - d_{p25}) \times \text{width} \times \text{breadth} = (1.265 - 1.155) \times 0.6 \times 1.5 = 0.099\text{m}^3\)
- \( a_{pit} \) = the internal surface area of the pit up to 50% effective depth and including the base area; = \((d_{p25} - d_{p20}) \times (\text{width} + \text{breadth}) \times 2 + (\text{width} \times \text{breadth}) = (1.265 - 1.155) \times (0.6 + 1.5) \times 2 + (0.6 \times 1.5) = 1.362\text{m}^2\)
- \( t_{p75-25} \) = the time for the water level to fall from 75% to 25% effective depth = 42 - 7 = 35 (mins) = 35 \times 60 = 2100 \text{ (seconds)}

therefore:

\[ f = \frac{0.099}{1.362 \times 2100} = 3.46 \times 10^{-6} \text{ m/s} \]

**Test observations:**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>LEGEND</th>
<th>DEPTH (m)</th>
<th>SAMPLE DEPTH/TYP</th>
<th>TIME (mins)</th>
<th>DEPTH TO WATER (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass onto brown sandy gravelly SILT, gravel consists of ferruginous limestone (TOP SOIL)</td>
<td></td>
<td>0.0</td>
<td></td>
<td>0</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.3</td>
<td></td>
<td>6</td>
<td>1.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>55</td>
<td>1.32</td>
</tr>
<tr>
<td>Loose orange brown very clayey some cobbles SAND and GRAVEL, gravel and cobbles consists of ferruginous limestone (MADE GROUND)</td>
<td></td>
<td>1.4m D</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Trial pit details: TP107**

- Ground level: 48.0m
- Method of excavation: JCB-3CX
- Date of excavation: 13.03.09
- Location plan reference: D-STE1362W-101
- Grid Reference: 482458,280123

**Trial pit depths/dimensions:**

- Depth of trial pit at start of test: 1.5m
- Depth to water at start of test: 1.1m
- Trial pit width: 0.6m
- Trial pit breadth: 1.5m
- Trial pit depth at completion of test: 1.5m

---

**Plot showing time against depth to water:**

Sample Table:

<table>
<thead>
<tr>
<th>SAMPLE DEPTH</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4m D</td>
<td>1.5</td>
</tr>
</tbody>
</table>

**Trial pit depths/dimensions:**

- Depth of trial pit at start of test: 1.5m
- Depth to water at start of test: 1.1m
- Trial pit width: 0.6m
- Trial pit breadth: 1.5m
- Trial pit depth at completion of test: 1.5m

---

**Description and strata of Soakaway SA107:**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>LEGEND</th>
<th>DEPTH (m)</th>
<th>SAMPLE DEPTH/TYP</th>
<th>TIME (mins)</th>
<th>DEPTH TO WATER (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass onto brown sandy gravelly SILT, gravel consists of ferruginous limestone (TOP SOIL)</td>
<td></td>
<td>0.0</td>
<td></td>
<td>0</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.3</td>
<td></td>
<td>6</td>
<td>1.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>55</td>
<td>1.32</td>
</tr>
<tr>
<td>Loose orange brown very clayey some cobbles SAND and GRAVEL, gravel and cobbles consists of ferruginous limestone (MADE GROUND)</td>
<td></td>
<td>1.4m D</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix B

Overland flow calculations - 4.0m channel
Summary Wizard of "CRITICAL BY RETURN PERIOD"(Rank 1 by Max Level)

Results for Design Storms

<table>
<thead>
<tr>
<th>PN</th>
<th>Storm</th>
<th>Return Period</th>
<th>Climate Change</th>
<th>Rank</th>
<th>First X Surcharge</th>
<th>First Y Flood</th>
<th>First Z Overflow</th>
<th>O/F Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>15 Summer</td>
<td>100</td>
<td>20%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.001</td>
<td>15 Summer</td>
<td>100</td>
<td>20%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lvl Ex.</th>
<th>PN</th>
<th>Water Lvl. (m)</th>
<th>Surcharged Depth (m)</th>
<th>Flooded Vol (m³)</th>
<th>Flow/Capacity</th>
<th>Overflow (l/s)</th>
<th>Pipe Flow (l/s)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>0.145</td>
<td>-0.105</td>
<td>0.000</td>
<td>0.39</td>
<td>0.0</td>
<td>1257.7</td>
<td>O K</td>
<td></td>
</tr>
<tr>
<td>1.001</td>
<td>-2.356</td>
<td>-0.106</td>
<td>0.000</td>
<td>0.38</td>
<td>0.0</td>
<td>1229.3</td>
<td>O K</td>
<td></td>
</tr>
</tbody>
</table>

Margin for Flood Risk warning (mm) 300
Inertia Status OFF
DTS Status ON Analysis Time Step Fine
DVD Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 100, 200
Climate Change (%) 20, 20
Summary Wizard of "CRITICAL" (Rank 1 by Max Level)

Results for Design Storms

<table>
<thead>
<tr>
<th>PN</th>
<th>Storm</th>
<th>Return Period</th>
<th>Climate Change</th>
<th>Rank</th>
<th>First X</th>
<th>First Y</th>
<th>First Z</th>
<th>O/F Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>15 Winter</td>
<td>200</td>
<td>20%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.001</td>
<td>15 Summer</td>
<td>200</td>
<td>20%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lvl Ex.</th>
<th>PN</th>
<th>Water Lvl. (m)</th>
<th>Surcharged Depth (m)</th>
<th>Flooded Vol (m³)</th>
<th>Flow/Capacity</th>
<th>Overflow (l/s)</th>
<th>Pipe Flow (l/s)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>0.159</td>
<td>-0.091</td>
<td>0.000</td>
<td>0.46</td>
<td>0.0</td>
<td>1467.0</td>
<td>O K</td>
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<tr>
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<td>-0.092</td>
<td>0.000</td>
<td>0.45</td>
<td>0.0</td>
<td>1428.1</td>
<td>O K</td>
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</tr>
</tbody>
</table>
Overland flow calculations - 10.0m channel
Summary Wizard of "CRITICAL BY RETURN PERIOD"(Rank 1 by Max Level)

Results for Design Storms

<table>
<thead>
<tr>
<th>PN</th>
<th>Storm</th>
<th>Return Period</th>
<th>Climate Change (%)</th>
<th>Rank</th>
<th>First X Surcharge</th>
<th>First Y Flood</th>
<th>First Z Overflow</th>
<th>O/F Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>15 Summer</td>
<td>100</td>
<td>20</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.001</td>
<td>15 Summer</td>
<td>100</td>
<td>20</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lvl Ex.</th>
<th>PN</th>
<th>Water Lvl. (m)</th>
<th>Surcharged Depth (m)</th>
<th>Flooded Vol (m³)</th>
<th>Flow/Capacity (l/s)</th>
<th>Overflow (l/s)</th>
<th>Pipe Flow (l/s)</th>
<th>Status</th>
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<tbody>
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<td></td>
</tr>
</tbody>
</table>
### Summary Wizard of "CRITICAL BY RETURN PERIOD" (Rank 1 by Max Level)

#### Results for Design Storms

<table>
<thead>
<tr>
<th>Margin for Flood Risk warning (mm)</th>
<th>Inertia Status</th>
<th>DTS Status</th>
<th>DVD Status</th>
<th>Analysis Time Step</th>
<th>Fine</th>
</tr>
</thead>
</table>

**Profile(s)** Summer and Winter  
**Duration(s) (mins)** 15, 30, 60, 120, 240, 360, 480, 960, 1440  
**Return Period(s) (years)** 100, 200  
**Climate Change (%)** 20, 20

<table>
<thead>
<tr>
<th>PN</th>
<th>Storm</th>
<th>Return Period</th>
<th>Climate Change</th>
<th>Rank</th>
<th>First X</th>
<th>First Y</th>
<th>First Z</th>
<th>O/F</th>
<th>Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>15 Summer</td>
<td>200</td>
<td>20%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.001</td>
<td>15 Summer</td>
<td>200</td>
<td>20%</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lvl Ex.</th>
<th>PN</th>
<th>Water Lvl. (m)</th>
<th>Surcharged Depth (m)</th>
<th>Flooded Vol (m³)</th>
<th>Flow/Capacity</th>
<th>Overflow (l/s)</th>
<th>Pipe Flow (l/s)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>0.092</td>
<td>-0.158</td>
<td>0.000</td>
<td>0.19</td>
<td>0.0</td>
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</tr>
<tr>
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<td>0.18</td>
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<td>1435.0</td>
<td>O K</td>
<td></td>
</tr>
</tbody>
</table>
Fernbrook Bio Ltd

Plastic Recycling Facility, Northamptonshire

May 2011

Detailed below is an outline specification to address the ventilation requirements of the proposed Plastic Recycling Facility.

A peripheral duct with suitable terminal devices will extract air from the process area to the air handler.

The air handler will have the facility for the installation of bag or activated carbon filters and have variable speed control providing up to five air changes per hour to the process area.

The air from the fan section will be discharged into a mixing chamber via a baffle plate to create maximum turbulence.

Atomisers will introduce odour absorption liquid into the chamber creating a saturated atmosphere and largest possible surface area.

The chamber will be sized to provide optimum dwell time between the extracted air and the absorbent.

Air will exit the chamber via expansion section to create pressure drop and minimise liquid carryover and be discharged at high level via penthouse louver.

VENTILATION EQUIPMENT SPECIFICATION

01: Air handling units

02: Air Filtration

03: Ductwork

04: Dampers

05: Air terminal devices

06: Attenuators

07: Air Conditioning

08: Maintenance
01: Air Handling Unit

01:01 Supplier
- TBA

Manufacturer:
- TBA

01:01 Standards:
- Air handling units are manufactured in the UK in accordance with BS EN ISO9001:2000 and all components conform to DW/144 & HVCA specifications.

02:02 Construction
- Unit casing constructed from mill finish aluminium 50mm pentapost framework with double skinned panels from galvanised sheet steel inner and outer skins with 45mm mineral wool insulation and complete with 100mm high galvanised steel base frame

01.02 Specification
- Air Volume: TBA
- External resistance: 500pa (a further 300pa has been included for induct pre-filters)
- Fan type DIDW forward curved centrifugal
- Fan speed 1399 rpm
- Motor power: TBA
- Absorbed power: TBA
- Motor type: TEFC 400v 3ph 50hz
- FL current: TBA
- Starting current: TBA
- Fan sound power levels: TBA

02: Air Filtration

02:01 Supplier
- TBA

Manufacturers:
- TBA

02.02 Standards
- BS ISO 5011
- BS 21 and BS EN 10226-1

02.03 Protection
- General purpose
- Oil free
- Dust, particle and vapour removal
- Odour control TBA
02:04 Bag Filter specification
- F5 bag filter will serve as pre-filter to carbon filters within AHU, and has greater dust holding and air volume capacity than panel filters.
- Classification is Grade F5 to EN779
- Maximum operating temperature 100°C (212°F)
- Flammability: Fire retardant to DIN53438 Classes F1 & K1

Construction
- The bag filter pockets filter comprises a corrosion resistant heavy gauge galvanised header frame housing the filter media which is supported by a copper coated rod assembly and tags which keep the media pockets from binding to each other.

Material
- The pockets are manufactured from a lofted non-woven synthetic material

Sizes
- TBA

Frame
- Filter retaining frame will be made from galvanised steel within the body of the inlet duct and will contain foam gasket to prevent air leakage and a side withdrawal access door to facilitate ease of removal.

02:08 Ancillaries
- Differential pressure gauge
- Drain trap to mixing chamber

03: Ductwork

03.01: Supplier & Installer
- Atmosphere Air Conditioning & Ventilation Ltd

Manufacturer
- TBA

03:02 Standards
- DW/144 HVCA Specification
- Leakage class B

03:03 Construction
- Ducts shall be constructed from galvanised sheet steel 1mm thickness

03:04 Ducting shall be manufactured in sections having flanged ends for joining
04: Dampers

04:01 Standards
- DW/144 HVCA Specification

04:02 Multi blade Dampers – Construction
- Multi blade dampers shall consist of a number of pivotal extruded aluminium blades contained within a galvanised steel casing.
- Blades are aerofoil section with silicon blade edge seals
- Dampers have stainless steel jamb seals
- Casings are roll formed with reinforced corners for strength and rigidity

04:03 Fire Damper – Standards
- Fire dampers conform to DW/144 and have been tested to 6 hour fire integrity in accordance with Warrington fire research laboratory BS476 part 20.

04.04 Fire damper construction
- Fire dampers are manufactured from roll formed galvanised steel
- Blades are fully interlocking with stainless steel torsion springs
- Dampers operated by fusible link release
- Damper fitted with HVCA building frame for solid wall fixing in accordance with HEVAC 6/5/83 rev 1 2002

05: Air Terminal Devices

05:01 Standards
- Linear bar grilles are manufactured in accordance with DW/144

05:02 Construction
- Linear grilles are constructed from extruded aluminium
- Blades are straight, 0 degree, at 17mm spacing
- Grilles are fitted with aluminium opposed key operated blade dampers
- Grilles are fitted with removable frames suitable for duct mounting

05:03 Penthouse Louvre
- Penthouse Louvre shall be curb mounted (by others) on roof with undrilled fixings for onsite drilling to ensure correct alignment.

05:04 Construction
- Manufactured from extruded aluminium having 75mm blades at 75mm pitch, with continuous mitred corners and gently sloping roof.
- Size TBA. Free area shall be not less than 50% to allow sufficient airflow without increasing system pressure and minimise any water ingress.
- Total unit weight: TBA
06: Attenuators

Supplier:
- TBA

Manufacturer:
- TBA

06:01 Standards
- Attenuators must be tested to both BS4718: 1971 and ISO 7235: 1996 and also UKAS standards

06:02 Specification
- Acoustics attenuators are constructed from pre-galvanised steel casings with mastic filled grooved longitudinal joints in accordance with DW/144.
- Flanges: will be Ductmate knock-on type 35mm.
- Splitters: All attenuators to have aerodynamically shaped bullnose fairings to the front and back. 0.7mm thick expanded metal facing to the acoustic infill
- Leakage: In accordance with DW/144 class B
- Sound absorption: To BS 3638 1963 absorption coefficient.
- Density: Minimum density of 45kg/m3, faced with glass cloth tissue.
- Acoustic material: Attenuators will contain ‘Attenufill’ this is a mineral fibre slab with a minimum installed compression rating of 5.0%. The material is inert, non combustible, non hygroscopic, vermin proof, rot proof and will not support bacteria growth.

07: Air Conditioning

09:07 Air Conditioning Units

Design Criteria

These are the standard conditions used to size and select your equipment.

Internal Condition  21°CdB ± 2°C @ 50%RH ± 8% approx.
External Summer  29°CdB @ 75% RH approx.
External Winter  2°C saturated

Summer conditions are calculated upon a typical day in August at approx. 14.00pm
Winter conditions are calculated upon a typical day in January.

Control conditions and tolerances specified will be those applicable to the air at the point of where the control-sensing instrument (thermostat) is mounted. Under exceptional circumstances, external conditions may vary above or below specified limits in which case internal conditions stated will also vary.
Methodology Selecting Inverter Driven Systems

On a typical air conditioning system the unit will heat and cool on demand, cooling the air down to the set temperature before turning off, as the air temperature rises above the set point the cooling cycle will begin again, this on / off cycle can cause a draught due to the high differential in air temperature typically 12ºC.

An inverter controlled system reduces the temperature differential by slowing down the compressor within the external condenser as the set temperature is achieved, this reduces the cooling capacity and so the differential in the air temperature. The system then runs at the required duty to off set the heat load from the room and eliminates the on / off cycle.

Running costs are reduced by between 30 and 70% of a standard system. The starting current is reduced and so fuse rating and cable size are smaller.

08: Fan Coil Units

TBA

09.00 Maintenance

09:01 Air Handling Units
  • Controller and regulators need to be regularly checked and certified in accordance with the Health & Safety Executive regulations for electrical equipment, ref HSG85 (second edition) ISBN0-7176 2164-2

09:02 Filters
  • The contractor shall allow for replacing all filter media within the ventilation plant at the following intervals. TBA

09:03 Ductwork
  • Ductwork should be examined every three months and cleaned as necessary using the original ductwork installer or a specialist Ductwork cleaning Company

09:04 Dampers
  • Dampers need only annual routine cleaning to ensure mechanism is running smoothly and this may require occasion oiling of damper gears.
  • Damper regulator needs to be maintained

09:05 Air Terminal Devices
  • Air terminal devices need no secondary maintenance apart from occasional cleaning which can be carried out with ductwork maintenance

09:06 Attenuators
  • Attenuators need no secondary maintenance apart from occasional cleaning which can be carried out with ductwork maintenance
Air Cooled Direct Expansion Heat Pump
Air Conditioning

This text relates to units with remote air cooled condensers working with direct expansion coolers for air conditioning applications.

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency</th>
<th>Action</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>6 month</td>
<td>Check for undue noise or vibration</td>
<td>Symptoms of mal-operation include high excessively hot discharge line temperatures.</td>
</tr>
<tr>
<td>Suction line</td>
<td>6 month</td>
<td>Check for symptoms of wet operation or excessive superheat</td>
<td>Wet or frozen suction line can be caused by incorrect refrigerant charge</td>
</tr>
<tr>
<td>Oil</td>
<td>6 month</td>
<td>Check condition and level within compressor case</td>
<td>Foaming of oil in compressor case sight glass is a sign of mal-operation</td>
</tr>
<tr>
<td>Refrigerant</td>
<td>6 month</td>
<td>Check accessible parts of system for leaks. Check temperature difference across coils For correct charge</td>
<td>Pay particular attention to all mechanical and welded joints.</td>
</tr>
<tr>
<td>Coils</td>
<td>6 month</td>
<td>Check for damage and dirt/dust accumulation. Clean Filters.</td>
<td>Sterilisation of coil surface may be required</td>
</tr>
<tr>
<td>Fan &amp; Motor</td>
<td>6 month</td>
<td>Check bearings, blades and guards</td>
<td>Ensure that all bolts, screws etc are in place and tight.</td>
</tr>
<tr>
<td>Item</td>
<td>Frequency</td>
<td>Action</td>
<td>Notes</td>
</tr>
<tr>
<td>-----------</td>
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</tr>
<tr>
<td>7. Drains</td>
<td>6 month</td>
<td>Check and clean. Ensure drain is clean and free of obstruction.</td>
<td>Sterilisation may be required</td>
</tr>
<tr>
<td>8. Capacity</td>
<td>6 month</td>
<td>Check motor start and run current against commissioning data.</td>
<td>High current can be caused by blocked condenser, low refrigerant charge or compressor fault</td>
</tr>
<tr>
<td>9. Pipework</td>
<td>6 month</td>
<td>Check pipework security and condition of insulation. Repair as necessary</td>
<td>Insulation should form a vapour proof seal to avoid condensation and heat loss</td>
</tr>
<tr>
<td>10. Cleanliness</td>
<td>6 month</td>
<td>Clean surfaces of air handlers and condensers</td>
<td>Remove dirt and rubbish from vicinity of plant</td>
</tr>
<tr>
<td>11. Electrical</td>
<td>6 month</td>
<td>Check for damage to flexible conduits. Tighten all terminal connections. Isolate local control panel and inspect for signs of overheating. Check integrity of electrical insulation</td>
<td>If any fuse carrier connections to compressors show any discolouration they must be changed. Pay particular attention to contactors and terminals including all thermistor controls in compressor terminal box.</td>
</tr>
<tr>
<td>12. Operation</td>
<td>6 month</td>
<td>Check and confirm that it is in accordance with design parameters.</td>
<td>i.e. Start/stops and regulates in accordance with control system</td>
</tr>
</tbody>
</table>