



09th March 2016

Permitting and Support Centre
Environmental Permitting Team
Environment Agency
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Dear Sir/Madam,

Application for a bespoke Part A Installation Environmental Permit for the operation of an Anaerobic Digestion Facility with the use of resultant biogas in two CHP units at Coursers Farm AD Development, Coursers Farm, St. Albans, Hertfordshire.

Please find enclosed a CD containing the application forms and supporting information in relation to this application. A payment of £10,712 was made via BACS transfer on the 29th of February 2016 Reference PSCAPPAGRIV005 as the application fee calculated using the OPRA charging calculation.

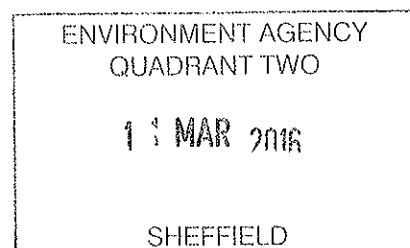
I would be grateful if you could confirm receipt of the application and fee.

I look forward to discussing the Permit Application with you in due course.

Yours sincerely,

A handwritten signature in cursive script that reads "David Olwell".

David Olwell
Project Planning and Permitting Manager
Agrivert Ltd.
dolwell@agrivert.co.uk



Application for an environmental permit Part A – About you



You will need to fill in this part A if you are applying for a new permit, applying to change an existing permit or surrender your permit, or want to transfer an existing permit to yourself. Please check that this is the latest version of the form available from our website.

Please read through this form and the guidance notes that came with it. Please write clearly in the answer spaces.

Note: if you believe including information on a public register would not be in the interests of national security you must tick the box in section 5 of F1 or F2 and enclose a letter telling us that you have told the Secretary of State. We will not include the information in the public register unless directed otherwise.

It will take less than one hour to fill in this part of the application form.

Where you see the term 'document reference' on the form, give the document references and send the documents with the application form when you've completed it.

Contents

- 1 About you
- 2 Applications from an individual
- 3 Applications from an organisation of individuals
- 4 Applications from public bodies
- 5 Applications from companies
- 6 Your address
- 7 Contact details
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1 About you

Are you applying as an individual, an organisation of individuals (for example, a partnership), a company (this includes Limited Liability Partnerships) or a public body?

An individual

Now go to section 2

An organisation of individuals (for example, a partnership)

Now go to section 3

A public body

Now go to section 4

A registered company or other corporate body

Now go to section 5

2 Applications from an individual

2a Please give us the following details

Name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Date of birth (DD/MM/YYYY)

Now go to section 6

3 Applications from an organisation of individuals

3a Type of organisation

For example, a charity, a partnership, a group of individuals or a club

3b Details of the organisation

If you are an organisation of individuals, please give the details of the main representative below. If relevant, provide details of other members (please include their title Mr, Mrs and so on) on a separate sheet and tell us the document reference you have given this sheet.

Contact name

Title (Mr, Mrs, Miss and so on)

First name

3 Applications from an organisation of individuals, continued

Last name

Date of birth (DD/MM/YYYY)

Now go to section 6

4 Applications from public bodies

4a Type of public body

For example, NHS trust, local authority, English county council

4b Name of the public body

4c Please give us the following details of the executive

An officer of the public body authorised to sign on your behalf

Name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Position

Now go to section 6

5 Applications from companies or corporate bodies

5a Name of the company

5b Company registration number

Date of registration (DD/MM/YYYY)

If you are applying as a corporate organisation that is not a limited company, please provide evidence of your status and tell us below the reference you have given the document containing this evidence.

Document reference

Now go to section 6

6 Your address

6a Your main (registered office) address

For companies this is the address on record at Companies House.

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

Postcode

Contact numbers, including the area code

Phone

Fax

Mobile

Email

6 Your address, continued

For an organisation of individuals every partner needs to give us their details, including their title Mr, Mrs and so on. So, if necessary, continue on a separate sheet and tell us below the reference you have given the sheet.

Document reference for the extra sheet

6b Main UK business address (if different from above)

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

Postcode

Contact numbers, including the area code

Phone

Fax

Mobile

Email

Now go to section 7

7 Contact details

7a Who can we contact about your application?

This can be someone acting as a consultant or an 'agent' for you.

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

Postcode

Contact numbers, including the area code

Phone

Fax

Mobile

Email

7 Contact details, continued

7b Who can we contact about your operation (if different from question 7a)?

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

Postcode

Contact numbers, including the area code

Phone

Fax

Mobile

Email

7c Who can we contact about your billing or invoice?

As in question 7a

As in question 7b

Please give details below if different from question 7a or 7b.

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

Postcode

Contact numbers, including the area code

Phone

Fax

Mobile

Email

8 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.environment-agency.gov.uk

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, or you would like us to review a decision we have made, please let us know. More information on how to do this is available at: <https://www.gov.uk/government/organisations/environment-agency/about/complaints-procedure>

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form? _____

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please

No thank you



For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No

Yes

Amount received

£ _____

Application for an environmental permit Part B2 – General – new bespoke permit



Fill in this part of the form together with parts A, F1 or F2 if you are applying for a new bespoke permit. You also need to fill in part B3, B4, B5, B6, or B7 (this depends on what activities you are applying for). Please check that this is the latest version of the form available from our website.

Please read through this form and the guidance notes that came with it. Please write clearly in the answer spaces.

It will take less than two hours to fill in this part of the application form.

Contents

- 1 About the permit
 - 2 About the site
 - 3 Your ability as an operator
 - 4 Consultation
 - 5 Supporting information
 - 6 Environmental risk assessment
 - 7 How to contact us
- Appendix 1 – Low impact installation checklist

1 About the permit

1a Discussions before your application

If you have had discussions with us before your application, give us the permit reference or details on a separate sheet. Tell us below the reference you have given this extra sheet.

Permit or document reference

1b Is the permit for a site or for mobile plant?

Site

Now go to section 2

Mobile plant

Now go to question 1c

Note: The term 'mobile plant' does not include mobile sheep dipping unit.

Mobile plant

1c Have we told you during pre-application discussions that we believe that a mobile permit is suitable for your activity?

No

Yes

1d Have there been any changes to your proposal since this discussion?

No Now go to section 3

Yes You should send us a description of the activity you want to carry out, highlighting the changes you have made since our pre-application discussions.

Document reference

Now go to section 3

2 About the site (but not mobile plant)

2a What is the site name, address, postcode and national grid reference?

Site name

Address

Postcode

National grid reference for the site
(for example, ST 12345 67890)

2b What type of regulated facility are you applying for?

Note: if you are applying for more than one regulated facility then go to 2c.

Installation Now tick the relevant box in question 2b1

Waste operation Now tick the relevant box in question 2b2

Mining waste operation Now tick the relevant box in question 2b3

Water discharge activity Now go to question 3d

Groundwater activity (point source) Now go to question 3d

Groundwater activity (discharge onto land) Now go to question 3d

What is the national grid reference for the regulated facility (if only one)? (See the guidance notes on part B2.)

As in 2a above

Different from that in 2a Please fill in the national grid reference below

National grid reference for the regulated facility

What is the type of activity?

2b1 Installation

Intensive farming installation

Local authority (Part A (2) and Part B)

Low impact installation (see question 2d below)

Opra charged activity

Paragraph-17 installation

2b3 Mining waste operation

Non-Opra charged activity

Opra charged activity

2b2 Waste operation

Landfill gas facility

Opra charged activity

Pet cemetery

Tier 2 charged bespoke activity

(see charging guidance for list)

Now go to question 2d

2 About the site, continued

2c If you are applying for more than one regulated facility on your site, what are their types and their grid references?

See the guidance notes on part B2.

Regulated facility 1

National grid reference _____

What is the regulated facility type?

- | | | |
|--|--------------------------|---|
| Installation | <input type="checkbox"/> | Now tick the relevant box in question 2c1 |
| Waste operation | <input type="checkbox"/> | Now tick the relevant box in question 2c2 |
| Mining waste operation | <input type="checkbox"/> | Now tick the relevant box in question 2c3 |
| Water discharge activity | <input type="checkbox"/> | Now go to question 3d |
| Groundwater activity (point source) | <input type="checkbox"/> | Now go to question 3d |
| Groundwater activity (discharge onto land) | <input type="checkbox"/> | Now go to question 3d |
| What is the type of activity? | | |

2c1 Installation

- Intensive farming installation
- Local authority (part A (2) and part B)
- Low impact installation (see question 2d below)
- Opra charged activity
- Paragraph-17 installation

2c2 Waste operation

- | | |
|--|--------------------------|
| <input type="checkbox"/> Landfill gas facility | <input type="checkbox"/> |
| <input type="checkbox"/> Opra charged activity | <input type="checkbox"/> |
| <input type="checkbox"/> Pet cemetery | <input type="checkbox"/> |
| <input type="checkbox"/> Tier 2 charged bespoke activity
(see charging guidance for list) | <input type="checkbox"/> |

2c3 Mining waste operation

- Non-Opra charged activity
- Opra charged activity

Regulated facility 2

National grid reference _____

What is the regulated facility type?

- | | | |
|--|--------------------------|---|
| Installation | <input type="checkbox"/> | Now tick the relevant box in question 2c1 |
| Waste operation | <input type="checkbox"/> | Now tick the relevant box in question 2c2 |
| Mining waste operation | <input type="checkbox"/> | Now tick the relevant box in question 2c3 |
| Water discharge activity | <input type="checkbox"/> | Now go to question 3d |
| Groundwater activity (point source) | <input type="checkbox"/> | Now go to question 3d |
| Groundwater activity (discharge onto land) | <input type="checkbox"/> | Now go to question 3d |
| What is the type of activity? | | |

What is the type of activity?

2c1 Installation

- Intensive farming installation
- Local authority (part A (2) and part B)
- Low impact installation (see question 2d below)
- Opra charged activity
- Paragraph-17 installation

2c2 Waste operation

- | | |
|--|--------------------------|
| <input type="checkbox"/> Landfill gas facility | <input type="checkbox"/> |
| <input type="checkbox"/> Opra charged activity | <input type="checkbox"/> |
| <input type="checkbox"/> Pet cemetery | <input type="checkbox"/> |
| <input type="checkbox"/> Tier 2 charged bespoke activity
(Charging guidance for list) | <input type="checkbox"/> |

2c3 Mining waste operation

- Non-Opra charged activity
- Opra charged activity

Use several copies of this page or separate sheets if you have a long list of regulated facilities. Send them to us with your application form. Tell us below the reference you have given these extra sheets.

Document reference for the extra sheets _____

Now go to question 2d

2 About the site, continued

2d Low impact installations (installations only)

Are any of the regulated facilities low impact installations?

No

Yes If yes, tell us how you meet the conditions for a low impact installation. (See the guidance notes on part B2 – Appendix 1.)

Document reference

Tick the box to confirm you have filled in the low impact installation checklist in appendix 1 for each regulated facility.

2e Treating batteries

Are you planning to treat batteries? (See the guidance notes on part B2.)

No

Yes Tell us how you will do this, send us a copy of your explanation and tell us below the reference you have given this explanation.

Document reference for the explanation

2f Multi-operator installation

If the site is a multi-operator site (that is there is more than one operator of the installation) then fill in the table below the application reference for each of the other permits.

Table 1 – Other permit application references

3 Your ability as an operator

If you are only applying for a standalone water discharge or for a groundwater activity, you only have to fill in question 3d.

3a Relevant offences (applies to all except standalone surface water discharges and groundwater discharges – see the guidance notes on part B2)

Have you, or any other relevant person, been convicted of any relevant offence?

No Now go to question 3b

Yes Please give details below

Name of the relevant person

Title (Mr, Mrs, Miss and so on)

First name

Last name

Date of birth (DD/MM/YYYY)

Position at the time of the offence

Name of the court where the case was dealt with

Date of the conviction (DD/MM/YYYY)

Offence and penalty set

Date any appeal against the conviction will be heard (DD/MM/YYYY)

If necessary, use a separate sheet to give us details of other relevant offences and tell us below the reference number you have given the extra sheet.

Document reference of the extra sheet

3 Your ability as an operator, continued

3b Technical ability (for specified waste management activities and waste operations only – see the guidance notes on part B2)

Please tick the scheme you are using to show you have the suitable technical skills and knowledge to manage your facility.

CIWM/WAMITAB

ESA/EU

Please send in a registration letter from your scheme as above

Now go to question 3c

3c Finances (for installations, waste operations and mining waste operations only)

Please note that if you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2010.

Do you or any relevant person have current or past bankruptcy or insolvency proceedings against you?

No

Yes Please give details below, including the required set-up costs (including infrastructure), maintenance and clean up costs for the proposed facility against which a credit check may be assessed.

We may want to contact a credit reference agency for a report about your business's finances.

Landfill, Category A mining waste facilities and mining waste facilities for hazardous waste only

How do you plan to make financial provision (to operate a landfill or a mining waste facility you need to show us that you are financially capable of meeting the obligations of closure and aftercare)?

Bonds

Escrow account

Trust fund

Lump sum

Other

Provide a plan of your estimated expenditure on each phase of the landfill or mining waste facility.

Give the document plan reference

Now go to question 3d

3d Management systems (all)

You can find guidance on management systems in 'How to Comply'. We have also developed environmental management toolkits for some business sectors which you can use to produce your own management system. You can get these by calling 03708 506 506 or by downloading them from our website at www.environment-agency.gov.uk.

Does your management system meet the conditions set out in our guidance?

No

Yes

3 Your ability as an operator, continued

What management system will you provide for your regulated facility?

EC Eco-Management and Audit Scheme (EMAS)

ISO 14001

BS 8555 (Phases 1–5)

Green Dragon

Own management system

Please make sure you send us a summary of your management system with your application.

Document reference or references

4 Consultation (fill in 4a to 4c for installations and waste operations and 4d for installations only)

Could the waste operation or installation involve releasing any substance into any of the following?

4a A sewer managed by a sewerage undertaker

No

Yes Please name the sewerage undertaker

4b A harbour managed by a harbour authority

No

Yes Please name the harbour authority

4c Direct into relevant territorial waters or coastal waters within the sea fisheries district of a local fisheries committee

No

Yes Please name the fisheries committee

4d Is the installation on a site for which:

4d1 a nuclear site licence is needed under section 1 of the Nuclear Installations Act 1965?

No

Yes

4d2 a policy document for preventing major accidents is needed under regulation 5 of the Control of Major Accident Hazards Regulations 1999, or a safety report is needed under regulation 7 of those Regulations?

No

Yes

5 Supporting information

5a Provide a plan or plans for the site (but not any mobile plant)

Clearly mark the site boundary or discharge point, or both – see the guidance notes on part B2.

Document reference or references of the plans

5b Provide the relevant sections of a site condition/baseline report if this applies (see the guidance notes on part B2 for what needs to be marked on the plan)

Document reference of the report

If you are applying for an installation, tick the box to confirm that you have sent in a baseline report.

5c Provide a non-technical summary of your application (see the guidance notes on part B2)

Document reference of the summary

6 Environmental risk assessment

Provide an assessment of the risks each of your proposed regulated facilities poses to the environment. The risk assessment must use H1 or an equivalent method.

Document reference for the assessment

7 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.environment-agency.gov.uk

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form? _____

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please

No thank you



For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No

Yes

Amount received

£ _____

Plain English Campaign’s Crystal Mark does not apply to appendix 1.

Appendix 1 – Low impact installation checklist (see the guidance notes on part B2)

Installation reference	Response		Do you meet this?
Condition	Response		Do you meet this?
A – Management techniques	Provide references to show how your application meets A.		Yes <input type="checkbox"/>
	References		No <input type="checkbox"/>
B – Aqueous waste	Effluent created	m ³ /day	Yes <input type="checkbox"/> No <input type="checkbox"/>
C – Abatement systems	Provide references to show how your application meets C.		Yes <input type="checkbox"/>
	References		No <input type="checkbox"/>
D – Groundwater	Do you plan to release any hazardous substances or non-hazardous pollutants into the ground?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
E – Producing waste	Hazardous waste	Tonnes per year	Yes <input type="checkbox"/>
	Non-hazardous waste	Tonnes per year	No <input type="checkbox"/>
F – Using energy	Peak energy consumption	MW	Yes <input type="checkbox"/> No <input type="checkbox"/>
G – Preventing accidents	Do you have appropriate measures to prevent spills and major releases of liquids? (See ‘How to comply’.)		Yes <input type="checkbox"/> No <input type="checkbox"/>
	Provide references to show how your application meets G.		Yes <input type="checkbox"/> No <input type="checkbox"/>
	References		
H – Noise	Provide references to show how your application meets H.		Yes <input type="checkbox"/>
	References		No <input type="checkbox"/>
I – Emissions of polluting substances	Provide references to show how your application meets I.		Yes <input type="checkbox"/>
	References		No <input type="checkbox"/>
J – Odours	Provide references to show how your application meets J.		Yes <input type="checkbox"/>
	References		No <input type="checkbox"/>
K – History of keeping to the regulations	Say here whether you have been involved in any enforcement action as described in Compliance History Appendix 1 explanatory notes.	Yes <input type="checkbox"/> No <input type="checkbox"/>	

Application for an environmental permit Part B3 – New bespoke installation permit



If you are applying for a new bespoke permit for an installation, fill in this part of the form, together with parts A, B2 and F1. Please check that this is the latest version of the form available from our website.

Please read through this form and the guidance notes that came with it. Please write clearly in the answer spaces.

It will take less than three hours to fill in this part of the application form.

Contents

- | | |
|---|---|
| <ul style="list-style-type: none">1 What activities are you applying for?2 Emissions to air, water and land3 Operating techniques | <ul style="list-style-type: none">4 Monitoring5 Environmental impact assessment6 Resource efficiency and climate change7 How to contact usAppendix 1 – Specific questions for the combustion sectorAppendix 2 – Specific questions for the chemical sectorAppendix 3 – Specific questions for the intensive farming sectorAppendix 4 – Specific questions for the clinical waste sectorAppendix 5 – Specific questions for the hazardous and non-hazardous waste recovery and disposal sectorAppendix 6 – Specific questions for the waste incineration sectorAppendix 7 – Specific questions for the landfill sector |
|---|---|

1 What activities are you applying for?

Fill in Table 1a below with details of all the activities listed in schedule 1 of the Environmental Permitting Regulations (EPR) and all directly associated activities (DAAs) (in separate rows) that you propose to carry out at the installation.

Fill in a separate table for each installation you are applying for. Use a separate sheet if you have a long list and send it to us with your application form. Tell us below the reference you have given the document.

Document reference

Table 1a – Types of activities

Schedule 1 listed activities						
Installation name	Schedule 1 references (See note 1)	Description of the Activity (See note 2)	Activity capacity (See note 3)	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity (if this applies) (See note 3)	Non-hazardous waste treatment capacity (if this applies) (See note 3)
Add extra rows if you need them. If you do not have enough room go to the line below or send a separate document and give us the document reference here	Put your main activity first			For installations that take waste only	For installations that take waste only	For installations that take waste only
Directly associated activities (See note 4)						
Name of DAA		Description of the DAA (please identify the schedule 1 activity it serves)				
Add extra rows if you need them						
For installations that take waste		Total storage capacity (See note 5 below)				
		Annual throughput (tonnes each year)				

1 What activities are you applying for?, continued

Notes

- 1 Quote the section number, part A1 or A2 or B, then paragraph and sub paragraph number as shown in part 2 of schedule 1 to the regulations.
- 2 Use the description from schedule 1 of the regulations. Include any extra detail that you think would help to accurately describe what you want to do.
- 3 By 'capacity', we mean:
 - the total incineration capacity (tonnes every hour) for waste incinerators;
 - the total landfill capacity (cubic metres) for landfills;
 - the total treatment capacity (tonnes each day) for waste treatment;
 - the total storage capacity (tonnes) for waste storage operations;
 - the processing and production capacity for manufacturing operations; or
 - the thermal input capacity for combustion activities.
- 4 Fill this in as a separate line and give an accurate description of any other activities associated with your schedule 1 activities. You cannot have DAAs as part of a mobile plant application.
- 5 By 'total storage capacity', we mean the maximum amount of waste, in tonnes, you store on the site at any one time.

Types of waste accepted

For those installations that take waste, for each line in Table 1a (including DAAs), fill in a separate document to list those types of waste you will accept onto the site for that activity. Give the List of Wastes catalogue code and description. If you need to exclude wastes from your activity or facility by restricting the description, quantity, physical nature, hazardous properties, composition or characteristic of the waste, include these in the document. Send it to us with your application form.

Please provide the reference for each document.

You can use Table 1b as a template.

If you want to accept any waste with a code ending in 99, you must provide more information and a full description in the document.

Document reference for this extra information _____

Table 1b – Template example – types of waste accepted and restrictions

Waste code	Description of waste
Example 02 01 08*	Example Agrochemical waste containing dangerous substances
06 01 02*	Hydrochloric acid

2 Emissions to air, water and land

Fill in Table 2 below with details of the emissions that result from the operating techniques at each of your installations.

Fill in one table for each installation.

Table 2 – Emissions (releases)

Installation name				
Point source emissions to air				
Emission point reference and location	Source	Parameter	Quantity	Unit
Point source emissions to water (other than sewers)				

2 Emissions to air, water and land, continued

Table 2 – Emissions, continued

Emission point reference and location	Source	Parameter	Quantity	Unit

Point source emissions to sewers, effluent treatment plants or other transfers off site

Emission point reference and location	Source	Parameter	Quantity	Unit

Point source emissions to land

Emission point reference and location	Source	Parameter	Quantity	Unit

Supporting information

3 Operating techniques

3a Technical standards

Fill in Table 3a for each activity at the installation you have referred to in Table 1a above and list the relevant technical guidance note (TGN) or notes you are planning to use. If you are planning to use the standards set out in the TGN, there is no need to justify using them.

You must justify your decisions in a separate document if:

- there is no technical standard;
- the technical guidance provides a choice of standards; or
- you plan to use another standard.

This justification could include a reference to the Environmental Risk Assessment provided in part B2 (General Bespoke Permit) of the application form.

The documents in Table 3a should summarise the main measures you use to control the main issues identified in the H1 assessment or technical guidance. For each of the activities listed in Table 3a, describe the type of operation and the options you have chosen for controlling emissions from your process.

3 Operating techniques, continued

Table 3a – Technical standards

Note: Fill in a separate table for each activity at the installation.

Installation name		
Schedule 1 activity or directly associated activity description	Relevant technical guidance note or best available techniques as described in BAT conclusions under IED (see footnote below). (You will need to refer to 'How to comply' for all permits)	Document reference (if appropriate)
	'How to comply'	

*Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

If appropriate, use block diagrams to help describe the operation and process. Give the document references you use for each diagram and description.

Document reference

3b General requirements

Fill in a separate Table 3b for each installation.

Table 3b – General requirements

Installation name	
If the TGN or H1 assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them	Document reference or references
If the TGN or H1 assessment shows that odours are an important issue, send us your odour management plan	Document reference or references
If the TGN or H1 assessment shows that noise or vibration are important issues, send us your noise or vibration management plan (or both)	Document reference or references

3c Types and amounts of raw materials

Fill in Table 3c for all schedule 1 activities. Fill in a separate table for each installation.

Table 3c – Types and amounts of raw materials

Installation name				
Capacity (See note 1 below)				
Schedule 1 activity	Description of raw material and composition material	Maximum amount (tonnes) (See note 2 below)	Annual throughput (tonnes each year)	Description of how the raw material is used including any main hazards (include safety information sheets)

Notes

- 1 By 'capacity', we mean the total storage capacity (tonnes) or total treatment capacity (tonnes each day).
- 2 By 'maximum amount', we mean the maximum amount of raw materials on your site at any one time.

3 Operating techniques, continued

Use a separate sheet if you have a long list of raw materials, and send it to us with your application form. Please also provide the document reference you have given the extra sheet.

Document reference

3d Information for specific sectors

For some of the sectors, we need more information to be able to set appropriate conditions in the permit. This is as well as the information you may provide in sections 5, 6 and 7. For those activities listed below, you must answer the questions in the related document.

Table 3d – Questions for specific sectors

Sector	Appendix
Combustion	See the questions in appendix 1
Chemicals	See the questions in appendix 2
Intensive farming	See the questions in appendix 3
Clinical waste	See the questions in appendix 4
Hazardous and non-hazardous waste recovery and disposal	See the questions in appendix 5
Incinerating waste	See the questions in appendix 6
Landfill	See the questions in appendix 7

General information

4 Monitoring

4a Describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above

You should also describe any environmental monitoring. Tell us:

- how often you use these measures;
- the methods you use; and
- the procedures you follow to assess the measures.

Document reference for this information

4b Point source emissions to air only

Provide an assessment of the sampling locations you have used to measure point source emissions to air. The assessment must use M1 (see the guidance notes on part B3).

Document reference of the assessment

5 Environmental impact assessment

5a Have your proposals had an environmental impact assessment under Council Directive 85/337/EEC of 27 June 1985 [Environmental Impact Assessment] (EIA)?

No Now go to section 6

Yes Please provide a copy of the environmental statement and, if the procedure has been completed:

- a copy of the planning permission; and
- the committee report and decision on the EIA.

Document reference for the copy

6 Resource efficiency and climate change

If the site is a landfill, you only need to fill in this section if the application includes landfill gas engines.

6a Describe the basic measures for improving how energy efficient your activities are

Document reference of this description

6b Provide a breakdown of any changes to the energy your activities use and create

Document reference of the breakdown

6 Resource efficiency and climate change, continued

6c Have you entered into, or will you enter into, a climate change levy agreement?

No Describe the specific measures you use for improving your energy efficiency.

Document reference of this description

Yes Please give the date you entered (or the date you expect to enter) into the agreement (DD/MM/YYYY)

Please also provide documents that prove you are taking part in the agreement.

Document reference of the proof you are providing

6d Tell us about, and justify your reasons for, the raw and other materials, other substances and water you will use

Document reference of this document

6e Describe how you avoid producing waste in line with Council Directive 2008/98/EC on waste

If you produce waste, describe how you recover it.

If it is technically and financially impossible to recover the waste, describe how you dispose of it while avoiding or reducing any effect it has on the environment.

Document reference for your description

7 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.environment-agency.gov.uk

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form? _____

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please

No thank you



For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No

Yes

Amount received

£ _____

Plain English Campaign's Crystal Mark does not apply to appendices 1 to 7.**Appendix 1 – Specific questions for the combustion sector****1 Identify the type of fuel burned in your combustion units (including when your units are started up, shut down and run as normal). If your units are dual fuelled (that is, use two types of fuel), list both the fuels you use**

Fill in a separate table for each installation.

Installation reference			
Type of fuel	When run as normal	When started up	When shut down
Coal			
Gas oil			
Heavy fuel oil			
Natural gas			
WID waste			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Other			

Notes

1 Not covered by Industrial Emissions Directive 2010/75/EU.

2 'Biomass' is referred to in www.opsi.gov.uk/si/si2002/20020914.htm.

Give extra information if it helps to explain the fuel you use.

Document reference _____

2 Give the composition range of any fuels you are currently allowed to burn in your combustion plant

Fill in a separate table for each installation.

Fuel use and analysis					
Installation reference					
Parameter	Unit	Fuel 1	Fuel 2	Fuel 3	Fuel 4
Maximum percentage of gross thermal input	%				
Moisture	%				
Ash	% wt/wt dry				
Sulphur	% wt/wt dry				
Chlorine	% wt/wt dry				
Arsenic	% wt/wt dry				
Cadmium	% wt/wt dry				
Carbon	% wt/wt dry				
Chromium	% wt/wt dry				
Copper	% wt/wt dry				
Hydrogen	% wt/wt dry				
Lead	% wt/wt dry				
Mercury	% wt/wt dry				
Nickel	% wt/wt dry				
Nitrogen	% wt/wt dry				
Oxygen	% wt/wt dry				
Vanadium	mg/kg dry				
Zinc	mg/kg dry				
Net calorific value	MJ/kg				

Appendix 1 – Specific questions for the combustion sector, continued

3 If NOx factors are necessary for reporting purposes (that is, if you do not need to monitor emissions), please provide the factors associated with burning the relevant fuels

Fill in a separate table for each installation.

Installation reference	
Fuel	NOx factor (kgt ⁻¹)
Fuel 1	
Fuel 2	
Fuel 3	
Fuel 4	

Note: kgt⁻¹ means kilograms of nitrogen oxides released for each tonne of fuel burned.

4 Will your combustion plant be subject to Chapter III of the Industrial Emissions Directive 2010/75/EU? (see Government guidance)

No Now fill in part F

Yes

5 Is your plant

an existing plant (a plant licensed before 1 July 1987)?

a new plant (a plant licensed on or after 1 July 1987 but before 27 November 2002, or a plant for which an application was made before 27 November 2002 and which was put into operation before 27 November 2003)?

or

a new-new plant (a plant for which an application was made on or after 27 November 2002)?

6 If you run more than one type of plant or a number of the same type of plant on your installation, please list them in the table below

Fill in a separate table for each installation.

Installation reference	
Type of plant	Number within installation
Existing	
New	
New-new	
Gas turbine (group A)	
Gas turbine (group B)	

7 If you run an existing plant, have you submitted a declaration for the ‘limited life derogation’ set out in Article 33 of Chapter III of the Industrial Emissions Directive?

No Now go to section 9

Yes

8 Have you subsequently withdrawn your declaration?

No

Yes

9 List the existing large combustion plants (LCPs) which have annual mass allowances under the National Emission Reduction Plan (NERP), and those with emission limit values (ELVs) under the LCPD

Installation reference	
LCPs under NERP	LCPs with ELVs

Appendix 1 – Specific questions for the combustion sector, continued

10 Do you meet the monitoring requirements of Chapter III of the Industrial Emissions Directive?

Yes

Document reference number

Appendix 2 – Specific questions for the chemical sector

1 Please provide a technical description of your activities

The description should be enough to allow us to understand:

- the process;
- the main plant and equipment used for each process;
- all reactions, including significant side reactions (that is, the chemistry of the process);
- the material mass flows (including by products and side streams) and the temperatures and pressures in major vessels;
- the all emission control systems (both hardware and management systems), for situations which could involve releasing a significant amount of emissions – particularly the main reactions and how they are controlled;
- a comparison of the indicative BATs and benchmark emission levels standards in Technical Guidance Notes (TGNs) EPR 4.01, EPR 4.02 and EPR 4.03, and chemical sector BREFs.

Document reference

2 If you are applying for a multi-purpose plant, do you have a multi-product protocol in place to control the changes?

No

Yes Provide a copy of your protocol to accompany this application

Document reference

3 Does Chapter V of the Industrial Emissions Directive (IED) apply to your activities?

No

Yes Fill in the following

3a List the activities which are controlled under the IED

Installation reference	
Activities	

3b Describe how the list of activities in question 3a above meets the requirements of the IED

Document reference

Appendix 3 – Specific questions for the intensive farming sector

1 For each type of livestock, tell us the number of animal places you are applying for

Installation reference	
Type of livestock	Number of places

2 Is manure or slurry exported from the site?

No

Yes

3 Is manure or slurry spread on the site?

No

Yes

Appendix 4 – Specific questions for the clinical waste sector

If you are applying for an activity covered by the Waste Incineration Directive and wish to accept clinical waste you should fill in questions 1, 2 and 3 of this appendix.

Note: If your procedures are fully in line with the standards set out in EPR5.07 then you should tick the ‘yes’ box and provide the procedure reference. There is no need for you to supply a copy of the procedure.

1 Are pre-acceptance procedures in place that are fully in line with the appropriate measures set out in section 2.2 of EPR 5.07 and which are used to assess a waste enquiry before it is accepted at the installation?

No Provide justification for departure from EPR 5.07 and submit a copy of the procedures

Document reference

Yes Document reference

2 Are waste acceptance procedures in place that are fully in line with the appropriate measures set out in section 2.2 of EPR 5.07, and which are used to cover issues such as loads arriving and being inspected, sampling waste, rejecting waste, and keeping records to track waste?

No Provide justification for departure from EPR 5.07 and submit a copy of the procedures

Document reference

Yes Document reference

3 Are waste storage, handling and dispatch procedures, and infrastructure in place that are fully in line with the appropriate measures set out in section 3.2 of EPR 5.07?

No Provide justification for departure from EPR 5.07 and submit a copy of the procedures

Document reference

Yes Document reference

4 Are monitoring procedures in place that are fully in line with the appropriate measures set out in section 3.3 of EPR 5.07?

No Provide justification for departure from EPR 5.07 and submit a copy of the procedures

Document reference

Yes Document reference

5 Are you proposing to either

- accept an additional waste not included in Table 2.1 of section 2.1 of EPR 5.07, or
- apply a permitted activity to a waste other than that identified for that waste in Table 2.1?

No

Yes Provide justification

Document reference

6 Please provide a summary description of the treatment activities undertaken on the installation. This should cover the general principles set out in section 2.1.4 of EPR 5.07

Document reference

7 Please provide layout plans detailing the location of each treatment plant and main plant items and process flow diagrams for the treatment plant

Document reference

Appendix 5 – Specific questions for the hazardous and non-hazardous waste recovery and disposal sector

Note: If your procedures are fully in line with the standards set out in SGN 5.06 then you should tick the 'yes' box and provide the procedure reference. There is no need for you to supply a copy of the procedure.

1 Are pre-acceptance procedures in place that are fully in line with the appropriate measures set out in section 2.1.1 of SGN 5.06, and which are used to assess a waste enquiry before it is accepted at the installation?

No Provide justification for departure from SGN 5.06 and submit a copy of the procedures

Document reference _____

Yes Document reference _____

2 Are waste acceptance procedures in place that are fully in line with the appropriate measures set out in section 2.1.2 of SGN 5.06, and which are used to cover issues such as loads arriving and being inspected, sampling waste, rejecting waste, and keeping records to track waste?

No Provide justification for departure from SGN 5.06 and submit a copy of the procedures

Document reference _____

Yes Document reference _____

3 Are waste storage procedures and infrastructure in place that are fully in line with the appropriate measures set out in section 2.1.3 of SGN 5.06?

No Provide justification for departure from SGN 5.06 and submit a copy of the procedures

Document reference _____

Yes Document reference _____

4 Provide a layout plan giving details of where the installation is based, the infrastructure in place (including areas and structures for separately storing types of waste which may be dangerous to store together) and capacity of waste storage areas and structures

Document reference _____

5 Provide a summary of the treatment activities carried out on the installation. This should cover the general principles set out in section 2.1.4 of SGN 5.06 and the specific principles set out in sections 2.1.5 to 2.1.15 as appropriate of SGN 5.06

Document reference _____

6 Provide layout plans giving details of where each treatment plant is based, the main items at each plant, and process flow diagrams for the treatment plant

Document reference or references _____

Appendix 6 – Specific questions for the waste incineration sector

If you are proposing to accept clinical waste please also fill in questions 1, 2 and 3 of appendix 4 above.

1a Do you run incineration plants as defined by Chapter IV of the Industrial Emissions Directive (IED)?

No You do not need to answer any other questions in this appendix

Yes IED applies

1b Are you subject to IED as an incinerator or co-incinerator?

As an incinerator

As a co-incinerator

2 Do any of the installations contain more than one incineration line?

No Now go to section 4

Yes

3 How many incineration lines are there within each installation?

Fill in a separate table for each installation

Installation reference	
Number of incineration lines within the installation	
Reference identifiers for each line	

You must provide the information we ask for in questions 4, 5 and 6 below in separate documents. The information must at least include all the details set out in section 2 ('Key Issues') of TGN S5.01 (under the subheading 'European legislation and your application for an EP Permit').

4 Describe how the plant is designed, equipped and will be run to make sure it meets the requirements of IED, taking into account the categories of waste which will be incinerated

Document reference

5 Describe how the heat created during the incineration and co-incineration process is recovered as far as possible (for example, through combined heat and power, creating process steam or district heating)

Document reference

6 Describe how you will limit the amount and harmful effects of residues and describe how they will be recycled where this is appropriate

Document reference

For each line identified in question 3, answer questions 7 to 13 below

Question 3 identifier, if necessary

7 Do you want to take advantage of the Article 45 (1)(f) allowance (see below) if the particulates, CO or TOC continuous emission monitors (CEM) fail?

No

Yes This article allows 'abnormal operation' of the incineration plant under certain circumstances when the CEM for releases to air have failed. Annex VI, Part 3(2) sets maximum half hourly average release levels for particulates (150mg/m³), CO (normal ELV) and TOC (normal ELV) during abnormal operation.

Describe the other system you use to show you keep to the requirements of Article 13(4) (for example, using another CEM, providing a portable CEM to insert if the main CEM fails, and so on).

Appendix 6 – Specific questions for the waste incineration sector, continued

8 Do you want to replace continuous HF emission monitoring with periodic hydrogen fluoride (HF) emission monitoring by relying on continuous hydrogen chloride (HCl) monitoring as allowed by IED Annex VI, Part 6 (2.3)?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you control hydrogen chloride and keep it to a level below the HCl ELVs.

No

Yes Please give reasons for doing this

9 Do you want to replace continuous water vapour monitoring with pre-analysis drying of exhaust gas samples, as allowed by IED Annex VI, Part 6 (2.4)?

Under this you do not have to continuously monitor the amount of water vapour in the air released if the sampled exhaust gas is dried before the emissions are analysed.

No

Yes Please give your reasons for doing this

10 Do you want to replace continuous hydrogen chloride (HCl) emission monitoring with periodic HCl emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen chloride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No

Yes Please give your reasons for doing this

Appendix 6 – Specific questions for the waste incineration sector, continued

11 Do you want to replace continuous HF emission monitoring with periodic HF emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No

Yes Please give your reasons for doing this

12 Do you want to replace continuous SO₂ emission monitoring with periodic sulphur dioxide (SO₂) emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for sulphur dioxide if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No

Yes Please give your reasons for doing this

13 If your plant uses fluidised bed technology, do you want to apply for a derogation of the CO WID ELV to a maximum of 100 mg/m³ as an hourly average, as allowed by IED Annex VI, Part 3?

No

Does not apply

Yes Please give your reasons for doing this

Appendix 7 – Specific questions for the landfill sector

1 Provide your Environmental Setting and Installation Design (ESID) report

Document reference

2 Provide your hydrogeological risk assessment (HRA) for the site

Document reference

3 Provide your stability risk assessment (SRA) for the site

Document reference

4 Provide your landfill gas risk assessment (LFGRA) for the site

Document reference

We have developed templates for these four reports which can be found within H1 – Landfill Annex.

5 Provide your proposed plan for closing the site and your procedures for looking after the site once it has closed

Document reference

Application for an environmental permit Part F1 – Opra, charges and declarations



Fill in this part for all applications for installations, waste operations, mining waste operations and groundwater discharges onto land. Please check that this is the latest version of the form available from our website.

For applications for water discharge and point source groundwater discharge activities you need to fill in part F2 instead.

Please read through this form and the guidance notes that came with it. Please write clearly in the answer spaces.

It will take less than two hours to fill in this part of the application form.

Contents

- 1 Working out charges
- 2 Opra
- 3 Payment
- 4 The Data Protection Act 1998
- 5 Confidentiality and national security
- 6 Declaration
- 7 Application checklist
- 8 How to contact us
- 9 Where to send your application

1 Working out charges (you must fill in this section)

You have to submit an application fee with your application. You can find out the charge by either looking at the relevant standard rules permit page, the ‘Making an application’ webpage at <http://www.environment-agency.gov.uk/business/topics/permitting/32318.aspx>, or the current environmental permitting charging scheme on our website at www.environment-agency.gov.uk which sets out our charges under the Environmental Permitting Regulations. Please remember that the charges are revised on 1 April each year and that there is an annual subsistence charge to cover the costs we incur in the ongoing regulation of the permit.

Note: for Opra charged Tier 3 Facilities you also need to complete an Opra profile (see section 2).

Table 1 – Working out charges

Type of application	Summary of charges			
	Charge identifier	Number of facilities	Charge for each facility (£)	Charges due (£)
Tier 2 facilities (including Part A(2) and Part B; see guidance notes on part F1)				
Tier 3 facilities				
Total Opra charging score for installations		× charge multiplier		=
Total Opra charging score for waste operations		× charge multiplier		=
Total Opra charging score for mining waste facilities		× charge multiplier		=
Other charges				
Total charges due				

2 Opra (does not apply to standard facilities, any other tier 2 permit applications (e.g. groundwater land spreading activities), or water-discharge or groundwater point source discharge activities)

If you are submitting a bespoke application, you must include a completed electronic copy in Excel of the current Opra spreadsheet.

For most variations, full and partial surrenders you will need to submit a copy of your current Opra profile based on your existing profile, not any new profile following the variation or surrender. Check the latest charges guidance for further advice.

For transfers you will need to submit a revised Opra profile to include your own operator performance. Note: this will not change the set transfer fee.

Tick this box to confirm that you have included the OPRA spreadsheet

3 Payment

Tick below to show how you have paid.

Cheque

Postal order

Cash

Tick below to confirm you are enclosing cash with the application

Credit or debit card

Electronic transfer (for example, BACS)

Remittance number

Date paid (DD/MM/YYYY)

How to pay

Paying by cheque, postal order or cash

Cheque details

Cheque made payable to

Cheque number

Amount

£

You should make cheques or postal orders payable to 'Environment Agency' and make sure they have 'A/c Payee' written across them if it is not already printed on.

Please write the name of your company and application reference number on the back of your cheque or postal order.

We will not accept cheques with a future date on them.

We do not recommend sending cash through the post. If you cannot avoid this, please use a recorded delivery postal service and enclose your application reference details. Please tick the box below to confirm you are enclosing cash.

I have enclosed cash with my application

Paying by credit or debit card

If you are paying by credit or debit card, either we can call you or you can fill in the separate form CC1 and enclose it with the application. We will destroy your card details once we have processed your payment. We can accept payments by Visa, MasterCard or Maestro card only.

Please call me to arrange payment by debit or debit card

I have enclosed form CC1 with my application

Paying by electronic transfer BACS reference

If you choose to pay by electronic transfer you will need to use the following information to make your payment.

Company name: Environment Agency
Company address: Income Dept 311, PO Box 263, Peterborough, PE2 8YD
Bank: Citigroup Centre
Address: Canada Square, London, E14 5LB
Sort code: 08-33-00
Account number: 12800543
Payment reference number: PSCAPPXXXXYYY

You need to create your own reference number. It should begin with PSCAPP (to reflect that the application is for a permitted activity) and it should include the first five letters of the company name (replacing the X's in the above reference number) and a unique numerical identifier (replacing the Y's in the above reference number). The reference number that you supply will appear on our bank statements.

3 Payment, continued

You should also email your payment details and reference number to FSC-Income@environment-agency.gov.uk or fax it to 01733 464 892.

If you are making your payment from outside the United Kingdom, it must be in sterling. Our IBAN number is GB23 CITI0833 0012 8005 78 and our SWIFTBIC number is CITI GB2LXXX.

If you do not quote your reference number, there may be a delay in processing your payment and application.

Now read section 4 below.

4 The Data Protection Act 1998

We, the Environment Agency, will process the information you provide so that we can:

- deal with your application;
- make sure you keep to the conditions of the licence, permit or registration;
- process renewals; and
- keep the public registers up to date.

We may also process or release the information to:

- offer you documents or services relating to environmental matters;
- consult the public, public organisations and other organisations (for example, the Health and Safety Executive, local authorities, the emergency services, the Department for Environment, Food and Rural Affairs) on environmental issues;
- carry out research and development work on environmental issues;
- provide information from the public register to anyone who asks;
- prevent anyone from breaking environmental law, investigate cases where environmental law may have been broken, and take any action that is needed;
- assess whether customers are satisfied with our service, and to improve our service; and
- respond to requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004 (if the Data Protection Act allows). We may pass the information on to our agents or representatives to do these things for us.

Now read section 5 below.

5 Confidentiality and national security

We will normally put all the information in your application on a public register of environmental information. However, we may not include certain information in the public register if this is in the interests of national security, or because the information is confidential.

You can ask for information to be made confidential by enclosing a letter with your application giving your reasons. If we agree with your request, we will tell you and not include the information in the public register. If we do not agree with your request, we will let you know how to appeal against our decision, or you can withdraw your application.

Only tick the box below if you wish to claim confidentiality for your application

Please treat the information in my application as confidential

National security

You can tell the Secretary of State that you believe including information on a public register would not be in the interests of national security. You must enclose a letter with your application telling us that you have told the Secretary of State and you must still include the information in your application. We will not include the information in the public register unless the Secretary of State decides that it should be included.

You can find guidance on national security in 'Core Environmental Permitting Guidance' published by Defra and available via our website at www.environment-agency.gov.uk.

You cannot apply for national security via this application.

Now go to section 6.

6 Declaration

If you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2010.

A relevant person should make the declaration (see guidance notes on part F1). An agent acting on behalf of an applicant is NOT a relevant person.

Each individual (or individual trustee) who is applying for their name to appear on the permit must complete this declaration. You will have to print a separate copy of this page for each additional individual to complete.

If you are transferring all or part of your permit, both you and the person receiving the permit must make the declaration. You must fill in the declaration directly below; the person receiving the permit must fill in the declaration under the heading 'For transfers only'.

6 Declaration, continued

Note: If you are unable to trace one or more of the current permit holders please see below under the transfers declaration.

I declare that the information in this application is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

I confirm that my standard facility will fully meet the rules that I have applied for (this only applies if the application includes standard facilities)

Tick this box to confirm that you understand and agree with the declaration above, then fill in the details below

Tick this box if you do not want us to use information from any ecological survey that you have supplied with your application (for further information please see the guidance notes on part F1)

Name

Title (Mr, Mrs, Miss and so on)

First name

Last name

on behalf of (if relevant; for example, a company or organisation and so on)

Position (if relevant; for example, in a company or organisation and so on)

Today's date (DD/MM/YYYY)

For transfers only – declaration for person receiving the permit

A relevant person should make the declaration (see guidance notes on part F1).

I declare that the information in this application to transfer an environmental permit to me is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

Note: If you cannot trace a person or persons holding the permit you may be able to transfer the permit without their declaration as above. Please contact us to discuss this and supply evidence in your application to confirm you are unable to trace one or all of the permit holders.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

Tick this box to confirm that you understand and agree with the declaration above

Name

Title (Mr, Mrs, Miss and so on)

First name

Last name

on behalf of (if relevant; for example, a company or organisation and so on)

Position (if relevant; for example, in a company or organisation and so on)

Today's date (DD/MM/YYYY)

Now go to section 7

7 Application checklist (you must fill in this section)

If your application is not complete we will return it to you. If you aren't sure about what you need to send, speak to us before you submit your application.

You must do the following:

Complete legibly all parts of this form that are relevant to you and your activities

Identify relevant supporting information in the form and send it with the application

7 Application checklist (you must fill in this section), continued

List all the documents you are sending in the table below.
If necessary, continue on a separate sheet. This separate sheet also needs to have a reference number and you should include it in the table below

For new permits or any changes to the site plan, provide a plan that meets the standards given in the guidance note on part F1

Provide a supporting letter for any claim that information is confidential

Get the declaration completed by a relevant person (not an agent)

Send the correct fee

Question reference	Document title	Document reference

8 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.environment-agency.gov.uk

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

9 Where to send your application (for how many copies to send see the guidance note on part F1)

Please send your filled in application form to:

Permitting Support Centre
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Do you want all information to be sent to you by email?

Please tick this box if you wish to have all communication about this application sent via email (we will use the details provided in Part A)

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form? _____

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please

No thank you



For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No

Yes

Amount received

£ _____



North London Anaerobic Digestion Facility

Site Environmental Permit: Supporting Statement

February 2016

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1) Document Scope

The following information is supplementary to that provided on the permit application forms. The letter/number notation relates to the different sections of the application forms. EPB2 refers to the environmental permit application form B2 and EPB3 refers to the environmental permit application form B3 both of which accompany this application.

2) Introduction

Agrivert Ltd. (Agrivert) is proposing to operate a bespoke Part A Installation Environmental Permit for the operation of an Anaerobic Digestion Facility with the use of resultant biogas in two CHP units. It is anticipated that the facility will generate in the region of 3MW of electricity output. The total quantity of feedstock that can be accepted at the site will be no more than 75,000 tonnes of biodegradable organic waste per annum (including processing liquids).

The proposed Anaerobic Digestion (AD) plant will be located within Coursers Farm, part of the Tyttenhanger Estate in Hertfordshire. The land was previously used for the grazing of livestock and is adjacent to an agricultural unit known as Coursers Farm which is a farm and horse stables. The wider Coursers Farm site includes many small businesses including a hire centre and ABC Fencing Ltd. The site is subject to a long term lease agreement between Agrivert and Tyttenhanger Estate.

The AD plant will be designed, built, owned and operated by Agrivert Limited. Agrivert has a dedicated Commercial Team to source food waste from Local Authorities and Commercial Customers including (waste management and food processing companies).

3) EPB2: Question 1a – Pre Application Discussions

On the 7th January 2016 Agrivert held pre-application discussions, prior to the finalisation of this Environmental Permit Application, with Environment Officers Bunmi Aboaba and Holly Watson at Agrivert's West London Anaerobic Digestion Facility. The Agenda of this meeting can be seeing in **Attachment 1 (i)** EA Pre Application Coursers Farm AD Agenda.

Following on from this meeting, on the 5th February 2016, Agrivert's Commercial Director Harry Waters made a presentation at London Colney Parish Council to brief them on the operations of the Anaerobic Digestion facility and the permit to be applied for. The content of the presentation can be seen in **Attachment 1 (ii)** London Colney Presentation and FAQ.

Agrivert are proposing to make an additional presentation to Colney Heath Parish Council in March 2016; however a date is yet to be confirmed.

4) EPB2: Question 3b – Technical Ability

4.1. Agrivert Competency

Agrivert Ltd (“Agrivert”) has 20 years' experience in the organic waste management sector. In the UK Agrivert manages organic waste recycling contracts in excess of 250,000 tonnes per annum. Agrivert works with 32 Local Authorities across the UK to process their organic waste. Agrivert holds a financially sound and pre-established leading position in the organic waste market.

Agrivert has established expertise and experience in securing finance, designing, building and operating plants to process organic waste, as well as being able to create sustainable agricultural/amenity markets for the end product. The design concept allows a diverse intake of waste streams, providing flexibility to their customers.

Agrivert's composting and AD facilities produce a desirable, sanitised, stable, low odour fertiliser that is Animal By-Products Regulated (ABPR) and Publicly Available Standard (PAS) PAS100/PAS110 accredited. Agrivert operates three PAS110 compliant AD facilities - two in Oxfordshire and a third AD facility in Surrey, with a further two plants under construction in 2016. Agrivert also operate two In-Vessel Composting (IVC) facilities and three green waste sites.

4.2. Operations

The North London AD plant will have a dedicated team of operatives to run the plant supported by Agrivert's Operations Manager and Commercial Team. The Commercial Team works to source feedstock and manage waste volumes for the plant. The Operations Team (plant manager and 2 operatives) will report to the Operations Manager.

Agrivert's Site Managers are trained and hold WAMITAB Certificates as seen in **Attachment 2**.

North London AD's design and processes are based on the four plants Agrivert has already delivered in the UK which have 10 years successful proven operational history.

4.3. Technically Competent Person

Agrivert's Site Managers are technically competent and trained to the requirements of the WAMITAB/CIWM operator competency scheme. Before the site is commissioned, any new Site Manager will obtain appropriate qualification/units relevant to anaerobic digestion facility as described in the WAMITAB/CIWM operator competency scheme guidelines, Version 6 - January 2014.

5) EPB2: Question 3d – Environmental Management System

5.1 Agrivert's Environmental Management System

Agrivert has a fully integrated Business Management System (BMS) that incorporates ISO 9001:2008 for Quality and also meets the requirements of ISO 14001:2004 for the Environment, and OHSAS 18001:2007 for Health & Safety. The BMS is audited internally and externally (carried out by the UKAS accredited audit company ISOQAR), to ensure the procedures and processes of the Company are effective and relevant. In its latest external ISO 9001 quality audit, Agrivert received no non-conformances.

These international standards are widely recognised by our customers as indicators of the importance Agrivert places upon protecting the environment, producing a quality service and product with high regard to the health and safety of all those that come into contact with our operations.

To ensure compliance to the standards Agrivert has developed a series of Process Control flow charts (APC), Quality Procedures (QP), Work Instructions (WI), Quality Documents (AQD) and safe systems of work to ensure any work carried out is done to a consistent standard.

By ensuring all the Agrivert's staff adhere to the system requirements we can continue to guarantee a high standard of work and service. To ensure Agrivert's system continues to run compliantly, a series of internal audits are carried out regularly throughout the year to highlight any areas of weakness. Agrivert expects its workforce to adhere to all known procedures and bring to their manager's attention any concerns they may have that could prevent any failures of the system.

The Agrivert Environmental Management System is fully integrated with compliance to our permits and can be seen in **Attachment 3**.

6) EPB2: Question 5a – Site plans

The following site plans have been included in the **Attachment 4**;

- i. Location Plan
- ii. Site Plan
- iii. Permit boundary, Point Source and Emissions Plan
- iv. Site Layout Surface Areas
- v. Process Flow Layout
- vi. Reception Building Clean & Dirty Areas
- vii. Site Location Plan with 1000m radius

7) EPB2: Questions 5b – Site Condition Report

A Site Condition Report has been prepared to support this Permit application. This Report can be found in **Attachment 5**.

8) EPB2: Question 5c – Non-Technical Summary

The proposed Anaerobic Digestion plant is located within Coursers Farm part of the Tyttenhanger Estate within Hertfordshire, between St. Albans and Potters Bar. The site lies within the Green Belt and Watling Chase Community Forrest. It is located approximately 2km north of Junction 22 (London Colney) of the M25 Motorway, 2km southwest of Hatfield and less than 1km southwest of the village of London Colney. It is located within the District of Hertsmere and the Parish of Ridge.

The site extends to approximately 5.2 hectares and the approximate centre of the site is OS grid reference TL 520318 204589.

HGV's leaving the site are required to turn left on to Coursers Road and travel to the west as there is a 7.5 tonne weight restriction imposed on Coursers Road further to the east. The site is located 2km from Junction 22 and 4km from Junction 23 of the M25; and within close proximity to the A1(M), A414, M10 and the M1.

Anaerobic Digestion (AD) refers to the process where organic material is biologically treated in the absence of oxygen using naturally occurring micro-organisms to produce biogas, which is used to generate renewable energy, which is subsequently fed into the National Grid. The process also produces a nutrient rich bio-fertiliser that can be used as both a fertiliser and a soil improver. Heat is produced as a by-product, which is partly utilised on site within the AD process (to heat the pasteurisers and digester tanks).

The facility will process and manage up to 75,000 tonnes of biodegradable organic waste per annum (including processing liquids). The facility will comprise the following elements:

- 2 x Primary and 2 x Secondary Digester tanks;
- 1 x Storage tank
- Pumping Containers;
- 3 x Pasteurisation tanks;
- 2 x CHP Units with associated ancillary equipment;
- Silage Clamp;
- Reception Building;
- Biofilter;
- Site Office.

It is anticipated that there will be approximately 54 two-way HGV movements a day, during peak digestate spreading. Outside of these times, there will be approximately 54 two way HGV movements and 6 staff movements per day. The capacity at the AD facility will be met primarily from food waste collected from households in the local area and wider Hertfordshire area. The facility allows Authorities flexibility to collect segregated wastes. A small quantity of silage will be delivered to the proposed AD facility each year for use as an energy crop. This is required to help balance the digester biology. Liquid wastes include compost leachate, waste cooking oils and drinks manufacturing waste and rainwater collected from on-site surface water attenuation and the harvesting of rainwater that falls on

the roof of the reception building [and clean water within the site boundary] can also be used in the AD process.

The biogas produced from the waste material will be fed through two Jenbacher gas engines to generate electricity. The electricity is transmitted directly into the National Grid via a high voltage connection. It is anticipated that the facility will generate in the region of 28GWh of electricity per annum, which is the equivalent power for approximately 6,240 households in addition to that used for the operation of the AD facility itself.

An Environmental Impact Assessment has been undertaken using the Environment Agency's H1 methodology. Overall it is concluded that the activities will not result in significant impacts upon environmental receptors, and that in general environmental controls and operational practices employed in the facility comply with the requirements of Best Available Techniques (BAT). The activities bring about environmental improvements through the facility's contribution to renewable energy generation.

A full non-technical description of the operation of the facility can be found in **Attachment 6**.

9) EPB2: Question 6 – Environmental Risk Assessment

9.1 Residential and ecological receptors

The nearest residential receptors surrounding the site are situated at 2 Coursers Road, 5 Coursers Road and 3 Coursers Road and Coursers Farm approximately 0.1km, 0.15km, 0.2km and 0.3km to the northeast respectively. A commercial property (Lawsons St Albans - Building Materials Supplier) is located 0.5km to the northwest.

The ecological desk study identified that there are no internationally designated sites present within 5km, however there are two statutorily designated sites within a 2km radius of the site boundary. These are Redwell Wood Site of Special Scientific Interest (SSSI) a broadleaved, mixed and yew woodland situated within 2km of the site; and Colney Heath Local Nature Reserve (LNR) contains a remnant of the heath vegetation community that used to be extensive in Hertfordshire, and is located within 0.5km of the site boundary.

For details see **Attachment 7(i) – Ecological Report prepared by EDP January 2012.**

An assessment of the impact of the facility on relevant sensitive receptors was carried out by REC Ltd. Details can be seen in **Attachment 7(ii) - Air Quality Assessment February 2016, Attachment 7(iii) Odour Assessment February 2016, and Attachment 7(iv) – Noise Impact Assessment February 2016.**

9.2 Screening Assessment

The table below sets out the screening assessment for the environmental issues that are included in the H1 guidance. Issues not screened out in this assessment will require a more detailed environmental risk assessment.

Table 1 Screening Assessment

Consideration	Receptors	Environmental Risk Assessment?	Discussion/Detailed Impact Assessment Conclusion
Odour	Human receptors	See Attachment 7 (iii) Odour February 2016	A detailed assessment has shown that predicted odour concentrations were below the relevant benchmark level of 3.00uE/m ³ at all sensitive receptors in the vicinity of the site for all modelling years. Maximum levels were predicted in close proximity to the odour sources, particularly the biofilter, with concentrations reducing sharply over a short distance. As such, odour nuisance is not anticipated as a result of normal operation of the plant. It is considered cumulative impacts will not be significant due to the low odour levels predicted to arise from the proposals. Odour Management Plan (OMP) has been prepared for the site and can be seen in Attachment 9
Noise	Human receptors	See Attachment 7 (iv) Noise Impact Assessment February 2016	A detailed assessment has shown that the calculated noise rating level from the proposed AD Facility will have no potential significant effects and mitigation measures are unwarranted.
Fugitive emissions	Human and ecological receptors Rivers and streams Drainage systems/sewers Groundwater	See Table 2 Fugitive Emissions Risk Assessment	Fugitive emissions will not result in significant impacts on the environment with proposed infrastructure and system controls in place.
Accidents	Human and ecological receptors Rivers and streams Drainage systems/sewers Groundwater	See Table 3 Accidents Risk Assessment	The accident risk assessment showed that the overall risk from the facility is low to medium provided that emergency procedures are implemented and followed. Therefore, operational procedures which identify the actions to be taken to minimise the potential causes of accidents and the consequences in the event of an accident occurring will be implemented. All personnel will be provided with suitable training to ensure they are familiar with the sites emergency procedures.

Consideration	Receptors	Environmental Risk Assessment?	Discussion/Detailed Impact Assessment Conclusion
Surface water	Rivers and streams Drainage systems/sewers	No	<p>Wastewater from welfare facilities will discharge to a package sewage treatment plant for full treatment before passing to the Coursers farm network.</p> <p>Excess rainwater from rainwater tank (Clean water) which operates with a high level alarm discharged to the landlord's surface water following testing. Further explained in section 12.</p>
Air	Human and ecological receptors	See Attachment 7 (ii) Air Quality Assessment February 2016	<p>A detailed assessment has shown that predicted concentrations of all pollutants considered for the protection of human health were below the relevant EQSs at all locations within the assessment extents for all meteorological data sets modelled. Impacts on baseline concentrations at sensitive receptor locations were considered unlikely to be significant.</p> <p>Impacts were predicted based on a worst-case assessment scenario of the facility constantly emitting the maximum anticipated level of each pollutant throughout an entire year. As such, predicted concentrations and deposition rates are likely to overestimate actual impacts.</p> <p>The immediate control of the CHP units will be by manual and automatic engine tuning for optimum engine combustion conditions. This will be supported by continual performance monitoring and maintenance which will indicate when a CHP unit falls out of the required operational specification. When this occurs, corrective action will be implemented, either by remote control or site attendance. The maintenance regime for the units will ensure that maximum availability is achieved.</p>
Site Waste	Land Rivers and streams Drainage systems/sewers	No	<p>There is no permanent waste deposition within the facility. All waste streams disposed of off-site will be sent to appropriately permitted facilities.</p> <p>Until PAS 110 is achieved for digestate, it will be spread on land as a waste (under deployment from EA) – see table 4 – Waste Impacts</p>

Consideration	Receptors	Environmental Risk Assessment?	Discussion/Detailed Impact Assessment Conclusion
Global warming potential	Global atmosphere (direct and indirect emissions)	No	<p>A CHP plant for the generation and use of power and heat from a renewable biogas source represents a positive impact with respect to global warming potential. The process makes use of biogas and avoids the release of methane, a more potent greenhouse gas. The heat produced by the CHP gas engines, will be used to heat the digesters. Measures to improve energy efficiency on site will be applied.</p> <p>See EPB3: Question 6 – Resource efficiency and climate change</p>
Groundwater	Groundwater source zones. e.g. protection	No	No emission points to groundwater. Appropriate site bunding provided. Emission to groundwater only in the unlikely event of a rainwater harvesting tank overflow. Rainwater harvesting tank is fitted with a high level alarm which initiates water sampling before any discharge occurs.
Justifying and cost and benefit analysis of control measures (if needed)	N/A	See Section 9.4	

9.3 Environmental Risk assessments of selected risks

Table 2 Fugitive Emissions Risk Assessment

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk		
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains?
To Air						
Biogas emissions from gas transfer systems, gas engine or gas storage in floating roof digesters	Residential and commercial properties	Wind-blown, dispersion in atmosphere	The gas system utilised is subject to regular preventative maintenance to minimise the potential for leaks occurring. The system is also protected with a comprehensive array of pressure and flow sensors and with isolation valves to minimise the potential for release if a leak is detected. A flare is utilised for the safe disposal of surplus gas in the event of plant breakdown, or a surplus of gas above the level that can be safely stored or utilised.	Low to moderate risk	Potential odour nuisance	Low residual risk
VOC	Residential and commercial properties	Air	As part of the odour control system, the Reception Building is held under negative pressure which controls VOCs.	Low to moderate risk	Potential odour nuisance	Low residual risk
Dust/ bioaerosols	Residential and commercial properties	Wind-blown, dispersion in atmosphere	<p>Site surfaced with concrete and tarmac to prevent dust forming in dry conditions.</p> <p>Cleaning and clearing on site daily and when issues arise.</p> <p>The process is an enclosed, liquid AD system that does not generate dust or bioaerosols.</p> <p>Waste tipping area is located in the Reception Building to control any fugitive emissions of dust arriving with the waste.</p>	Low	Nuisance	Low residual risk

Vermin or other pests	Residential and commercial properties	Air	Pest control, using expert contractors. Regular checks. Food waste contained by closed vehicles, speed doors and bunkers.	Low	Nuisance	Low residual risk
To Water, Groundwater or Land						
Storage and digestion of waste	Ground, surface water, groundwater	Spillage from storage tanks or digesters	Plant offers a completely sealed liquid management system. Area of storage tanks and digesters is appropriately banded. If a major failure resulted in 25% of the volume of all tanks above ground on site escaping then it would be contained within the bund. Regular inspection and maintenance of infrastructure in place.	Moderate risk	Pollution of groundwater beyond the facility	Low residual risk with infrastructure and systems controls
Storage of oil and chemicals (new and waste)	Ground, surface water, groundwater	Spillage, leaks during use and deliveries of materials	Provision of secondary containment (double skinned tank) with isolated drainage, to collect potential spills. Regular inspection and maintenance of infrastructure.	Low to moderate risk particularly during filling and transfer of materials	Pollution of watercourse and groundwater beyond the facility	Low residual risk with infrastructure and systems controls
Vermin or other pests	Residential and commercial properties	Land	Pest control, using expert contractors. Regular checks. Food waste contained by closed vehicles, speed doors and bunkers.	Low	Nuisance	Low residual risk
Litter (mainly arriving in food waste deliveries)	Residential and commercial properties	Air	Vehicles must be covered. Written agreements and ongoing communications with clients.	Medium	Nuisance	Low residual risk with systems controls

Table 3 Accidents Risk Assessment

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk		
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains?
Major fire	Local population and ecological receptors	Windblown dispersion.	<p>Process inputs are not flammable in normal conditions.</p> <p>Biogas stored in the absence of oxygen to prevent fire and explosions</p> <p>Plant constructed to DSEAR specifications</p> <p>Fire detection systems installed at CHP engines. Automatic cut off valve to biogas supply installed.</p> <p>Follow Site Emergency Plan and inform relevant authorities</p>	Very unlikely	Severe	Low to medium provided procedures are followed
Minor fire	Local population. Ecological receptors	Windblown dispersion.	See above for major fire	Unlikely	Significant	Low to medium provided procedures are followed.
Failure to contain firewater	Local water courses. Ground and groundwater.	Surface water Diffusion into ground.	<p>Fire prevention measures as above.</p> <p>Plant offers a completely sealed liquid management system and the site is banded to CIRIA C736 Standards</p>	Unlikely	Significant	Low to Medium
Vandalism	Local population. Ecological receptors. Local water courses. Ground and groundwater.	Windblown dispersion. Surface water drainage system. Diffusion into ground.	Security measures are in place including perimeter fence with controlled access gates. Regular inspection of perimeter fences.	Somewhat unlikely	Noticeable	Low to Medium

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk		
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains?
Flood	Local water courses. Ground and groundwater.	Surface water Diffusion into ground.	<p>There are 6 small surface water bodies and dry courses within 500m radius of the site and the site is located within Zone 1 flood plain “land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).”</p> <p>Drainage features have been specified in accordance with recommendations made in the Flood Risk Assessment undertaken for the development.</p> <p>Inform EA. Take appropriate corrective and preventative actions to minimise environmental impact</p>	Unlikely	Severe	Low
Fuel / oil spills from vehicles	Local water courses. Ground and groundwater.	Surface water Diffusion into ground.	<p>Supervised off-loading. Hardstanding in all areas used by vehicles.</p> <p>Plant offers a completely sealed liquid management system.</p> <p>Clean up according to COSHH data sheets and appropriate disposal arrangements.</p>	Somewhat unlikely	Noticeable	Low to medium
Both CHP failure – release of biogas	Local population	Windblown dispersion	<p>Service contract – on call 24 hours</p> <p>Automatic flaring of excess biogas when pressure reaches a high level.</p>	Unlikely	Minor	Low
Significant leak of biogas	Local population.	Windblown dispersion.	<p>Regular maintenance and inspections. Pressure is monitored 24/7 by operations control centre. Any alarms initiated are actioned immediately.</p> <p>DSEAR risk assessment will be carried out before plant is commissioned and appropriate zoning implemented.</p> <p>Treat gas through flare if possible. Inform EA and emergency services. Invoke Site Emergency Plan.</p>	Very unlikely	Minor	Low

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk		
Hazard	Receptor	Pathway	Risk management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs – who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains?
Failure of storage tanks	Local water courses. Ground and groundwater.	Surface water Diffusion into ground.	Plant offers a completely sealed liquid management system. Area of storage tanks and digesters is appropriately bunded. If a major failure resulted in 25% of the volume of all tanks above ground on site escaping then it would be contained within the bund. Regular inspection and maintenance of infrastructure in place. Clean up minor spillage according to COSHH data sheets and appropriate disposal arrangements.	Unlikely	Minor	Low
Overfilling of digesters or storage tank	Local water courses. Ground and groundwater.	Surface water Diffusion into ground.	Process monitored continuously – Fail safe system stops material being pumped in. Raise email alarm sent to operator in charge. Overflow material would be enclosed in bund area.	Unlikely	Minor	Low
Failure of below ground storage tanks and pipework	Ground and groundwater.	Diffusion into ground	Regular checks of underground tanks Secondary contained with a leak protection membrane. Poured in situ concrete tank Inspection hole into leak detection layer.	Unlikely	Severe	Low
Power failure	Air Local water courses. Ground and groundwater.	Process failure leading to fugitive emission	If power is down for an extended period, bring in generator to flare biogas. Critical systems are designed to connect to a temporary generator. Biogas production is reduced during power failures. Emergency lighting in Reception Building.	Unlikely	Minor	Low

Table 4 Waste Impacts

Waste Stream No	Description of Waste Stream	Storage method	Amount produced per year	Nature of waste	Disposal or recovery option
1	Digestate (until PAS110 is secured) Waste code: 19 06 06	Covered lagoons	70,000 m3	Biodegradable non hazardous	Land spreading (R10) Score: 16
2	Plastics packaging	Concrete floor with appropriate drainage	To be confirmed when facility is fully operational	Other non-hazardous waste	Landfill (D5) Score: 60
3	Waste lubrication oil	Double skinned tank	16,000 liters	Hazardous waste	Various recovery options depending on selected contractor (R1 – R12) Score: between 30 and 60
4	Maintenance waste Batteries, oil filters etc.	Appropriate waste containers	Minor quantities	Hazardous waste	Waste unsuitable for recovery will be disposed to landfill (D5) Max score: 300
5	Office waste	Sealed commercial bins	To be confirmed when facility is operational	Biodegradable non hazardous	Mostly recovered. Waste unsuitable for recovery will be disposed to landfill (D5) Max score: 120

9.4 BAT Assessments

Indicative BAT Assessment for Fugitive Emissions to Air

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

1. **Dust – The following general techniques should be employed where appropriate:**
 - **Covering of skips and vessels**
 - **Avoidance of outdoor or uncovered stockpiles (where possible)**
 - **Where dust creation is unavoidable, use of sprays, binders, stockpile management techniques, windbreaks and so on**
 - **Regular wheel and road cleaning (avoid transfer of pollution to water and wind blow)**
 - **Closed conveyors, pneumatic or screw conveying (noting the higher energy needs), minimising drops. Filters on the conveyors to clean the transport air prior to release**
 - **Regular housekeeping**
 - **Enclosed silos (for storage of bulk powder materials) vented to fabric filters. The recycling of collected material should be considered under Section 2.6.**
 - **Enclosed containers or sealed bags used for smaller quantities of fine materials**

Fugitive emissions of dust to air are prevented through detailed site design and operational experience – the site is constructed with a concrete surface to prevent dust forming in dry conditions. The main causes of dust are considered to be caused through incoming vehicles or operations within the crop storage area. The mesophilic AD process is a wet process that does not generate dust or bioaerosols. The waste tipping area is located in the Reception Building to control any fugitive emissions of dust arriving with the waste. Site Design has limited the potential for litter and mud to be released outside the site boundary – the site has sealed hard standing running surfaces which prevent mud forming in wet conditions. Any litter arriving with waste deliveries is contained in the Reception Building within the depackaging process.

2. **VOC's**
 - **When transferring volatile liquids, the following techniques should be employed – subsurface filling via (anti-syphon) filling pipes extended to the bottom of the container, the use of vapour balance lines that transfer the vapour from the container being filled to the one being emptied, or an enclosed system with extraction to suitable abatement plant.**
 - **Vent systems should be chosen to minimise breathing emissions (for example pressure/vacuum valves) and, where relevant, should be fitted with knock-out pots and appropriate abatement equipment.**
 - **Maintenance of bulk storage temperatures as low as practicable, taking in to account changes due to solar heating etc.**
 - **The following techniques should be used (together or in any combination) to reduce losses from storage tanks at atmospheric pressure:**
 - **Tank Paint with low solar absorbency**
 - **Temperature Control**

- **Tank Insulation**
- **Inventory Management**
- **Floating Roof Tanks**
- **Bladder Roof Tanks**
- **Pressure/vacuum valves, where tanks are designed to withstand pressure fluctuations**
- **Specific release treatment (such as adsorption condensation)**

BAT was followed with site design for controlling VOCs on site. The management of VOCs is carried out in accordance with site-specific work instructions. The AD process, by its nature, is a sealed gas-tight process in normal operation. As part of the odour control system, the Reception Building is held under negative pressure which controls VOCs. The tanks are constructed from concrete which is then covered in a layer of insulation and a further layer of metal cladding. Temperature is controlled through a radiator system which continually circulated warm water around the tanks maintaining them at a constant and controlled temperature.

3. For information on Odour, see Section 2.2.6 on Page 72.

See BAT Analysis for Odour below.

- 4. A leak detection and repair (LDAR) programme should be established for the installations handling solvents and similar volatile materials. In addition:**
- **Non-intrusive tank volume measurements should be used**
 - **When cleaning filters, filter pot lids should be replaced as soon as possible**
 - **Filter slops should be stored in sealed drums**
 - **Contaminated waters have potential for odours and should be stored in covered tanks**
 - **Drum storage (see Section 2.1.3 on page 32) should be regularly inspected**
 - **Maintenance schedules should ensure regular cleaning/desludging of tanks to avoid large scale decontamination activities. All odorous materials being transferred directly to sealed containers.**
 - **Tanker washing should be conducted under a permit to work scheme. If the load is likely to give rise to odour, then the first wash should be with water/aqueous waste and discharged direct to abated storage systems before opening the tanker manways. Open tanker barrel for the minimum amount of time. All washings to be directed to abated storage systems.**

BAT was followed with site design for efficient and safe maintenance of the site containment facilities. All tanks are fitted with a leak detection system which enables site operatives to assess whether the tanks are beginning to leak, regular checks are undertaken. The maintenance programme for containment facilities is carried out in accordance with site management and maintenance schedule. See examples of checks in **Attachment 8 Management and maintenance schedule.**

Indicative BAT Assessment for Fugitive Emissions to Water

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

1. For subsurface structures:

- **Establish and record the routing of all installation drains and subsurface pipework;**
- **Identify all sub-surface sumps and storage vessels;**
- **Engineer systems to minimise leakages from pipes and ensure swift detection if they do occur, particularly where hazardous (i.e. Groundwater-listed) substances are involved;**
- **Provide secondary containment and/or leakage detection for sub-surface pipework, sumps and storage vessels;**
- **Establish an inspection and maintenance programme for all subsurface structures, e.g. pressure tests, leak tests, material thickness checks or CCTV.**

The routing of all installation drainage and sub-surface pipework are established and recorded. See Drainage Philosophy in Section 12) and **Attachment 4 – Site plans**

2. All sumps should:

- **Be impermeable and resistant to stored materials;**
- **Be subject to regular visual inspection and any contents pumped out or otherwise removed after checking for contamination**
- **Where not frequently inspected, be fitted with a high level probe and alarm as appropriate;**
- **Be subject to programmed engineering inspection (normally visual, but extending to water testing where structural integrity is in doubt).**

All sumps are impermeable and resistant to stored materials. Where accessible, they are regularly visually inspected by operatives and pumped out after checking for contamination. Sumps that are not accessible to visual inspections are fitted with a high level probe and alarm linked to the control system. All sumps are water tested after construction, visually inspected during the life of the plant and will be water tested again in the event that their structural integrity is in doubt.

3. For surfacing:

- **Design appropriate surfacing and containment or drainage facilities for all operational areas, taking into consideration collection capacities, surface thickness, strength/reinforcement; falls, materials of construction, permeability, resistance to chemical attack, and inspection and maintenance procedures;**
- **Have an inspection and maintenance programme for impervious surfaces and containment facilities;**

- **Unless the risk is negligible, have improvement plans in place where operational areas have not been equipped with:**
 - **An impervious surface**
 - **Spill containment kerbs**
 - **Sealed construction joints**
 - **Connection to a sealed drainage system**

The site surfacing is detailed in **Section 12**. The surfacing is subject to visual inspections by operatives during the working day to maintain constant vigilance over any damage or necessary maintenance.

4. All above-ground tanks containing liquids whose spillage could be harmful to the environment should be bunded. Further information on bund sizing and design, see “Releases to water references” on page 131. Bunds should:

- **Be impermeable and resistant to the stored materials;**
- **Have no outlet (that is, no drains or taps) to drain to a blind collection point**
- **Have pipework routed within bunded areas with no penetration of contained surfaces;**
- **Be designed to catch leaks from tanks or fittings;**
- **Have capacity greater than 110% of the largest tank or 25% of the total tankage, whichever is larger;**
- **Be subject to regular visual inspection and any contents pumped out or otherwise removed under manual control after checking for contamination;**
- **Where not frequently inspected, be fitted with a high-level probe and an alarm, as appropriate;**
- **Where possible, locate tanker connection points within the bund, otherwise provide adequate containment;**
- **Be subject to programmed engineering inspection (normally visual, but extending to water testing where structural integrity is in doubt).**

The site bunding is detailed in **Section 12**.

Indicative BAT Assessment for Noise and Vibration

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

Describe the main sources of noise and vibration (including infrequent sources): the nearest noise-sensitive locations and relevant environmental surveys which have been undertaken; and the proposed techniques and measures for the control of noise.

The main sources of noise and the nearest noise-sensitive locations are detailed in the Noise Impact Assessment for the site (as seen in **Attachment 7(iv)**).

- 1. The Operator should employ basic good practice measures for the control of noise, including adequate maintenance of any parts of plant or equipment whose deterioration may give rise to increases in noise (for example, bearings, air handling plant, the buildings fabric and specific noise attenuation kit within plant or machinery).**

Noise is managed in accordance with the Agrivert Work Instruction “Noise Mitigation and Monitoring” as seen in **Attachment 10(i)**.

- 2. The Operator should employ such other noise control techniques necessary to ensure that the noise from the installation does not give rise to reasonable cause for annoyance, in the view of the Regulator. In particular, the Operator should justify where the Rating Levels ($L_{Aeq,T}$) from the installation exceed the numerical value of the Background Sound Level ($L_{A90,T}$)**

The CHP engines on site are fitted with an exhaust gas silencer and enclosed in a steel container to prevent noise nuisance. All incoming vehicles will unload waste within the enclosed reception building with closed doors. Delivery vehicles waiting to enter the reception building will do with their engines off.

A detailed assessment has shown that the calculated noise rating level from the proposed AD Facility falls below the criteria level adopted and as such consideration of noise mitigation measures is unwarranted as seen in **Attachment 7 (iv) Noise Impact Assessment February 2016**.

Noise is managed in accordance with the Agrivert Work Instruction “Noise Mitigation and Monitoring” as seen in **Attachment 10(i)**.

- 3. Further justification will be required should the resulting field rating level ($L_{AR,TR}$) exceed 50dB by day and a façade rating level exceed 45dB by night, with day being defined as 0700 to 2300 and night 2300 to 0700.**

The calculated specific noise levels do not exceed 50dB by day or 45 dB by night.

- 4. In some circumstances “creeping background” (i.e. creeping ambient) may be an issue. Where this has been identified in pre-application discussions or in previous discussions with the local authority, the Operator should employ**

such noise control techniques as are considered appropriate to minimise problems to an acceptable level within the BAT criteria.

No “creeping background” issues have been identified.

- 5. Noise surveys, measurements, investigations (e.g. on sound power levels of individual items of plant) or modelling may be necessary for either new or existing installations, depending upon the potential for noise problems. Where appropriate, the Operator should have a noise management plan as part of its management system.**

A Noise Impact Assessment was carried out for the site by REC Consultants in February 2016 and can be seen in **Attachment 7 (iv)**, and noise generated by the CHP units will be closely monitored at commissioning. Historically we know that the noise levels are within acceptable tolerances, as noise has been monitored on similarly designed plants and we have also collected noise data from one of our existing AD sites. Noise is managed in accordance with the Agrivert Work Instruction “Noise Mitigation and Monitoring” as seen in **Attachment 10(i)**.

Indicative BAT Assessment for Odour

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

- 1. The requirements for odour control will be installation-specific and depend on the sources and nature of the potential odour. In general:**

Installation-specific requirements for odour control have been identified and will be implemented.

- 2. Where odour can be contained, for example within buildings, the Operator should maintain the containment and manage the operations to prevent its release at all times.**

Sealed vessels are used for the AD process. Wastes are handled in enclosed reception building where access is gained through speed doors. As part of the odour control system, the Reception Building is held under negative pressure. The air is extracted and treated through a wet scrubber and wood chip and bark biofilter (which removes odours) before venting to the atmosphere. The liquid waste storage tanks and mixing tank, used to contain the wastes at the front end, are located underground and enclosed within the reception building to prevent odour release.

A water scrubber was chosen following BAT analysis at similar AD sites which identified that water scrubbers were more robust and efficient at reducing odorous particles than chemical scrubbers. Through BAT analysis it was identified that there are numerous environmental and operational benefits of not dosing chemicals.

Design Parameters for Air Extraction are detailed in the **Odour Management Plan (OMP) seen in Attachment 9.**

- 3. Where odour releases are expected to be acknowledged in the Permit (i.e. contained and treated prior to discharge or discharged for atmospheric dispersion):**

- For existing installations, the releases should be modelled to demonstrate the odour impact at sensitive receptors. The target should be to minimise the frequency of exposure to ground level concentrations that are likely to cause annoyance.**
- For new installations, or for significant changes, the releases should be modelled and it is expected that the Operator will achieve the highest level of protection that is achievable with BAT from the outset.**
- Where there is no history of odour problems then modelling may not be required although it should be remembered that there can still be an underlying level of annoyance without complaints being made.**
- Where, despite all reasonable steps in the design of the plant, extreme weather or other incidents are liable, in the view of the Regulator, to increase the odour impact at receptors, the Operator should take appropriate and timely action, as agreed with the Regulator, to prevent**

further annoyance (these agreed actions will be defined either in the Permit or in an odour management statement).

An Odour Assessment (February 2016) were carried out (**Attachment 7 (iii)**). It has shown that predicted odour concentrations were below the relevant benchmark level of 3.0ouE/m³ at all sensitive receptors in the vicinity of the site for all modelling years. As such, odour nuisance is not anticipated as a result of normal operation of the plant. It is considered cumulative impacts will not be significant due to the low odour levels predicted to arise from the proposals.

- 4. Where odour generating activities take place in the open, (or potentially odorous materials are stored outside) a high level of management control and use of best practice will be expected.**

Silage storage in the silage clamp for use in the process has a potential to be odorous. Silage stored in the open is sheeted once delivered to site and remains sheeted until required. The front edge of silage re-sheeted if not required for more than one week. Its management is explained in further detail in the Odour Management Plan seen in **Attachment 9**.

- 5. Where an installation releases odours but has a low environmental impact by virtue of its remoteness from sensitive receptors, it is expected that the Operator will work towards achieving the standards described in this Note, but the timescales allowed to achieve this might be adjusted according to the perceived risk.**

The odour standards in this Note will be met from the outset.

- 6. The objective is to prevent emissions of odorous releases that are offensive and detectable beyond the site boundary. This may be judged by the likelihood of complaints. However, the lack of complaint should not necessarily imply the absence of an odour problem.**

Monitoring of odorous releases will be carried out in accordance with the site OMP. The monitoring plan is proactive, and investigation of odour complaints is only one of a range of methods used.

- 7. Assessment of odour impact should cover a range of reasonably foreseeable odour generation and receptor exposure scenarios, including emergency events and the effect of different mitigation options.**

A full range of scenarios and suitable mitigation measures are included in the site OMP and can be seen in **Attachment 9 “Odour management for Failures”**.

- 8. For complex installations, for example where there are a number of potential sources of odorous releases or where there is an extensive programme of improvements to bring odour under control, an odour management plan should be maintained.**

An OMP will be implemented and maintained for the site.

- 9. Emphasis should be placed on pre-acceptance screening (see Section 2.1.1 on Page 20) and the rejection of specific wastes, for examples, mercaptans, low molecular weight amines, acrylates or other similarly high odorous materials, that are only suitable for acceptance under special handling requirements. These may include dedicated sealed handling areas with extraction to abatement.**

Pre-acceptance screening will assess specific wastes for highly odorous materials and they will only be accepted if the odours can be successfully contained within the Reception Building.

- 10. Scrubber liquors should be monitored to ensure optimum performance, i.e. correct pH, replenishment and replacement.**

Scrubber liquors will be monitored to ensure optimum performance. Clean water is held on site to be added to the wet scrubber if required.

Indicative BAT Assessment for Accidents

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

1. **A formal structures accident management plan should be in place which covers the following aspects:**

These aspects are covered in the site's Environmental Risks Assessment in **Table 3 Accidents Risk Assessment**.

2. **A – Identification of hazards to the environment posed by the installation using a methodology akin to a HAZOP study.**

HAZOP study was undertaken. These aspects are covered in the site's Environmental Risks Assessment in **Table 3 Accidents Risk Assessment**.

3. **B – assessment of risks.**

These aspects are covered in the site's Environmental Risks Assessment in **Table 3 Accidents Risk Assessment**.

4. **The depth and type of assessment will depend on the characteristics of the installation and its location.**

These aspects are covered in the site's Environmental Risks Assessment in **Table 3 Accidents Risk Assessment**.

5. **C – identification of the techniques necessary to reduce the risks.**

These aspects are covered in the site's Environmental Risks Assessment in **Table 3 Accidents Risk Assessment**.

10) EPB3: Question 1 – What activities are you applying for?

10.1. Proposed regulated activities

Agrivert is proposing to operate a bespoke Part A Installation Environmental Permit for the operation of an Anaerobic Digestion Facility with the use of resultant biogas in two CHP units. It is anticipated that the facility will generate in the region of 3MW of electricity output. The total quantity of feedstock that can be accepted at the site will be no more than 75,000 tonnes of biodegradable organic waste per annum. The facility will comply with Animal By-Products Regulations (ABPR).

The assessment has been carried out and the proposed facility falls outside the scope of any relevant Standard Rules Permits.

The listed activities proposed within this permit application are in accordance with this new set of regulations. Schedule 1 listed activities and associated Directly Associated Activities (DAAs) are summarised in **Table 5 - Proposed Regulated Activities** below.

Table 5 - Proposed Regulated Activities

EPR or Schedule Reference	1	Description of Activity	Annex IIA or IIB	Activity Capacity
Part A(1) Section 5.4 Part A(1)(b)(i)		Recovery of non-hazardous waste with a capacity exceeding 100 tonnes per day involving (i) biological treatment;	R3: recycling or reclamation of organic substances used as solvents R13: for temporary storage	The total annual throughput up to 75,000 tonnes of liquid and solid organic waste (including processing liquids): Daily treatment capacity of 280t/day (based on 5.5 Days) Maximum waste storage is 29,885m ³
Directly Associated Activities				
Name of DAA		Description of the DAA	Annex IIA or IIB	Activity Capacity
Physical pre-treatment of waste		Mechanical treatment of waste including screening, mixing and blending	D9 Physico-chemical treatment which results in compounds or mixtures which are discarded	2 x Bunkers (80m ³) Mixing Tank 860m ³ And Floor capacity 100m ³ Total Capacity 1120m ³
Combustion of resultant biogas		The combustion of fuel (biogas and gas oil) for the purpose of	R1: Use principally as a fuel or other means to generate energy	Biogas 10t/day

	generating electricity and heat for use within the installation and export to the national grid.		
Biogas storage	Storage of biogas in floating roof digesters		Maximum size of biogas storage – Approx. 9142m ³
Gas Flare	Use of an auxiliary flare required only for short periods of breakdown or maintenance of facility.	D10: Incineration on land	N/A
Raw Materials Storage	Storage of silage Storage of lubrication oil used in the CHP engines		Silage Storage Clamp capacity – 3000 tonnes Lubrication oil tanks capacity – 5000 litres
Digestate Storage	Storage of digestate prior to transport off-site to spread to land or for storage off-site	R13: for temporary storage	Digestate tanks capacity - 5587 m ³
Waste Oil Storage	Storage of used lubrication oil used in CHP engines		2500 litres
Waste Liquid Storage	Storage of liquids within the Reception Building or within the Silage Storage Tank		700 m ³ (2 liquid tanks) 100 m ³ Silage Leachate Tank 800 m ³ Total
Scrubber and Biofilter	Waste reception building odour control unit		N/A
Temporary boiler ¹	The combustion of gas oil for the purpose of generating heat for use within the installation.	R1: Use principally as a fuel or other means to generate energy	

Note 1 – During the commissioning of the AD site, a temporary boiler will be required to facilitate on site operations until such time as the site becomes fully operational.

It is proposed to install a temporary hot water boiler situated within a container with a rated value of 367kW (1.25 Mbtu) and a maximum working pressure of 4 bar (58psi). The boiler and its associated chimney are approximately 5m in height. The dimensions of the boiler container are 3.3m long x 2m wide x 2.13m in height. The boiler arrives fully packaged, complete with controls and burner and is suitable for use with 35 sec oil. It utilises 4inch flow and return pipework and includes a 3 phase circulating pump. A boiler will occasionally be hired should maintenance works be required.

10.2. Waste storage capacity

The following capacity is available across the site and is indicative of the total amount of waste that can be retained onsite on any given day.

Table 6 Waste Storage Capacity

Element	Capacity	Total Capacity
Waste reception bunkers (2)	80m ³ per bunker	160m ³
Liquid Tanks (2 tanks)	250m ³ and 450m ³	700m ³
Mixing Tank	860m ³	860m ³
Primary Digesters (2 tanks)	5,587m ³ per tank	11,174m ³
Secondary Digesters (2 tanks)	5,587m ³ per tank	11,174m ³
Pasteurisation Tanks (3 tanks)	30 m ³ per tank	90m ³
Storage Tank	5,587m ³ per tank	5,587m ³
Silage Clamp Leachate Tank	100m ³	100m ³
	Total	29,845m³

The silage clamp located to the south end of the site has the capacity to hold 3,000 tonnes of silage at any one time. The Silage clamp has been designed to meet the SSAFO regulations.

10.3. Waste Accepted on site

Agrivert is proposing to accept the following waste types onto the site for the biological treatment. This is in line with the EA/WRAP Quality Protocol for Anaerobic digestate (January 2014).

Table 7 - Types of waste accepted

EWC	Permitted Waste
02	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing
02 01	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing
02 01 01	Sludges from washing and cleaning – biodegradable only
02 01 02	Animal-tissue waste
02 01 03	Plant-tissue waste
02 01 06	Animal faeces, urine and manure (inc. spoiled straw), effluent, collected separately and treated offsite
02 01 07	Wastes from forestry
02 01 99	Spent mushroom compost or discarded mushrooms from commercial mushroom cultivation only
02 02	Wastes from the preparation and processing of meat, fish and other foods of animal origin.
02 02 01	Sludges from washing and cleaning – biodegradable only
02 02 02	Animal-tissue waste
02 02 03	Materials unsuitable for consumption or processing
02 03 04	Sludges from on-site effluent treatment – biodegradable only
02 02 99	Sludges from gelatine production; animal gut contents
02 03	Wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation
02 03 01	Sludges from washing, cleaning, peeling, centrifuging and separation
02 03 04	Materials unsuitable for consumption and processing
02 03 05	Sludges from on-site effluent treatment – biodegradable only
02 03 99	Sludges from production of edible fats and oils; seasoning residues; molasses residues;

	residues from production of potato, corn or rice starch
02 04	Wastes from sugar processing
02 04 03	Sludges from on-site effluent – biodegradable only
02 04 99	Wastes from sugar processing – biodegradable wastes only allowed if no chemical agents added and no toxic residues
02 05	Wastes from the dairy products industry
02 05 01	Materials unsuitable for consumption or processing including solid and liquid dairy products, milk, food processing wastes, yoghurt, whey
02 05 02	Sludges from on-site effluent treatment – biodegradable only
02 06	Wastes from the baking and confectionary industry
02 06 01	Materials unsuitable for consumption or processing including food condemned, food processing wastes, biscuits, chocolate, yeast, bread, bakery wastes
02 06 03	Sludges from on-site effluent treatment
02 07	Wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)
02 07 01	Wastes from washing, cleaning and mechanical reduction of raw materials including brewing waste, food processing waste, fermentation waste
02 07 02	Wastes from spirits distillation including spent grains, fruit and potato pulp, sludge from distilleries
02 07 04	Materials unsuitable for consumption or processing including brewing wastes, food processing waste, fermentation waste, alcoholic drinks, fruit juice
02 07 99	Malt husks, malt sprouts, malt dust; spent grains; hops; yeast and yeast like residues, sludges from production process
03	Wastes from wood processing and the production of panels and furniture, pulp paper and cardboard
03 01	Wastes from wood processing and the production of panels and furniture
03 01 01	Waste bark and cork
03 01 05	Sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 03	Wastes from pulp, paper and cardboard production and processing
03 03 10	Fibre rejects, fibre-, filler- and coating-sludges from mechanical separation
03 03 11	Sludges from on-site effluent treatment other than those mentioned in 03 03 10

04	Wastes from the leather, fur and textile industries
04 01	Wastes from the leather and fur industry
04 01 01	Wastes from leather industry
04 02	Waste from the textile industry
04 02 10	Organic matter from natural products (for example grease, wax)
15	Waste packaging, absorbents, wiping cloths, filter materials and protective clothing not otherwise specified
15 01	Packaging (including separately collected municipal packaging waste)
15 01 01	Paper and cardboard packaging
15 01 03	Wooden packaging
15 01 05	Composite packaging – biodegradable packaging only
19	Waste from waste management facilities, offsite waste water treatment plants and the preparation of water intended from human consumption and water for industry use
19 02	Wastes from physical/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)
09 02 03	Premixed wastes composed only of non-hazardous wastes
19 02 06	Sludges from physico/chemical treatment other than those mentioned in 19 02 05
19 02 10	Combustible wastes other than those mentioned in 19 02 08 and 19 02 09 – glycerol not designated as hazardous
19 05	Wastes from aerobic treatment of solid waste
19 05 01	Non-composted fraction of municipal and similar wastes
19 05 02	Non-composted fraction of animal and vegetable wastes
19 05 03	Off-specification compost from source segregated biodegradable waste
19 05 99	Liquor/leachate from a composting process; Digestate from an aerobic digestion process
19 06	Wastes from anaerobic treatment of waste
19 06 03	Liquor from anaerobic treatment of municipal waste
19 06 04	Digestate from anaerobic treatment of municipal waste (source segregated waste only)
19 06 05	Liquor from anaerobic treatment of animal and vegetable waste

19 06 06	Digestate from anaerobic treatment of animal and vegetable waste
19 08	Wastes from waste water treatment plants not otherwise specified
19 08 09	Grease and oil mixture from oil/water separation containing only edible oil and fats
19 08 12	Sludges from industrial biological treatment of industrial waste water other than those mentioned in 19 08 11
19 12	Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions.
20 01	Separately collected fractions (except 15 01)
20 01 01	Paper and cardboard
20 01 08	Biodegradable kitchen and canteen waste
20 01 25	Edible oil and fat
20 01 38	Untreated wood where there is no non-biodegradable coating or preserving substance present
20 02	Garden and park wastes (including cemetery waste)
20 02 01	Biodegradable waste
20 03	Other municipal wastes
20 03 01	Mixed municipal wastes – separately collected biowastes
20 03 02	Waste from markets – allowed only if source segregated biodegradable fractions e.g. plant material, fruit and vegetables

11) EPB3: Question 2 – Emissions to air, water and land

A plan showing all emission points is located in **Attachment 4 (iii)** Permit Boundary Point Source & Emissions.

11.1 Emissions to Air

The North London AD facility will have three primary point source emissions to air:

- Two 10.5 m high stacks from CHP engines (Emission points A1, A2)
- One 10 m high stack from which gases from the flare will be emitted (Emission point A3)
- One 5 m high temporary boiler chimney (Emission point A4)

In addition to the above point source emissions there will be 5 Pressure Relief Valves (PRVs) which will only operate under abnormal conditions, to prevent excess build-up of biogas within the system. A PRV will be fitted on each of the two primary digester tanks, on the two secondary digester tanks and one storage tank.

Table 8 - Point source emissions to air

Emission point reference and location	Source	Parameter	Quantity	Unit
A1 A2 (Attach 4 (iii) Permit Boundary Point Source & Emissions)	Engine 1 and Engine 2 exhaust stack	Nitrogen Oxides	21.6 ¹	Tonnes/year
		Sulphur Dioxide	15.1 ¹	Tonnes/year
		nmVOCs	3.25 ¹	Tonnes/year
		VOC	43.2 ¹	Tonnes/year
		Carbon Monoxide	60.5 ¹	Tonnes/year
A3 (Attach 4 (iii) Permit Boundary Point Source & Emissions)	Flare stack	Nitrogen Oxides	Emergency use only	
		Sulphur Dioxide		
		nmVOCs		
		VOC		
		Carbon Monoxide		
A4 (Attach 4 (iii) Permit Boundary Point Source & Emissions)	Temporary auxiliary boiler	Nitrogen Oxides	Gas oil boiler. Temporary use only.	
		Sulphur Dioxide		
		nmVOCs		
		VOC		
		Carbon Monoxide		
V1, V2, V3, V4, V5 (Attach 4 (iii))	Primary and secondary digesters and	Hydrogen Sulphide	Emergency use only	
		Methane		

Permit Boundary Point Source & Emissions)	storage tank pressure release valves (PRV)	Carbon Dioxide	
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Note 1 - The pollutant mass emission rates from the biogas engines for use in the assessment were derived from the Biogas Engines Emission Limit Value. See Air Quality Assessment Coursers Farm February 2016 and Odour Assessment Coursers Farm February 2016. This represents a conservative assessment approach with emissions from the engines assumed to be the maximum permitted. Emissions from the biogas engines were assumed to be constant, with the plant in operation 24-hours per day, 365-days per year. This is considered to be a worst-case assessment scenario as plant shut-down or periods of reduced work load are not reflected in the modelled emissions.

Visible Plume

The CHP unit is expected to run continuously for substantial periods of time and will therefore rarely require starting from cold in cold weather. On this basis, it is not considered likely that regular visible plume emissions will arise and no further analysis has been carried out.

Table 9 - Proposed limits

Emission point reference and location	Source	Parameter	Quantity	Unit
A1 A2 (Attach 4 (iii) Permit Boundary Point Source & Emissions)	Engine 1 and Engine 2	Nitrogen Oxides	500	mg/m ³
		Sulphur Dioxide	350	mg/m ³
		nmVOCs	75	mg/m ³
		VOC	1000	mg/m ³
		Carbon Monoxide	1400	mg/m ³
A3 (Attach 4 (iii) Permit Boundary Point Source & Emissions)	Flare	Nitrogen Oxides	No proposed limits – emergency use only	
		Sulphur Dioxide		
		nmVOCs		
		VOC		
		Carbon Monoxide		
A4 (Attach 4 (iii) Permit Boundary Point Source & Emissions)	Temporary auxiliary boiler	Nitrogen Oxides	No proposed limits – Temporary use only.	
		Sulphur Dioxide		
		nmVOCs		
		VOC		
		Carbon Monoxide		
V1, V2, V3, V4, V5 (Attach 4 (iii) Permit Boundary Point Source & Emissions)	Primary and secondary digesters and storage tank pressure release valves (PRV)	Hydrogen Sulphide	No proposed limits – emergency use only	
		Methane		
		Carbon Dioxide		

11.2. Control of Sulphur Dioxide emissions from the engines

The biogas produced by the digesters is naturally high in sulphides. Sulphides are a problem for gas engines and must be reduced where possible. This is controlled in 4 stage process

- **Stage 1** Small and controlled amounts of air are pumped into the biogas store. This process oxidises some of the sulphides.
- **Stage 2** Ferrous Chloride is then added periodically to the digester. This process converts sulphides into iron sulphates which form 'stalactite' crystals on netting within the digesters.
- **Stage 3** A net is suspended across the top of the digesting liquid, on which sulphur crystals grow. As they gain sufficient weight, they fall from the net back into the digestate and remain in their solid form rather than exiting the digester as a gas. The elemental sulphur which drops into the digestate improves its fertiliser value.
- **Stage 4** The biogas is additionally 'scrubbed' through an activated carbon filter and passed through a condenser before being processed by the gas engines.

11.3. Emissions to surface water or groundwater

There will be no point source emissions to surface water or groundwater from the activities on site other than under the rare circumstances resulting in a high level overflow from the rainwater harvesting – as explained 12) EPB3: Question 3 Operating techniques section 12.6.

11.4. Emissions to sewer

Table 10 Point source emissions to sewer

Emission point and location	Source	Parameter	Quantity	Unit
Discharge to Package Sewage Treatment Plant for full treatment	Wastewater from site welfare facilities will discharge to a package sewage treatment plant on-site	N/A	N/A	N/A

There are no limits proposed for this release as it is well within the capacity and capability of the package sewage treatment plant which was appropriately sized to accommodate the offices.

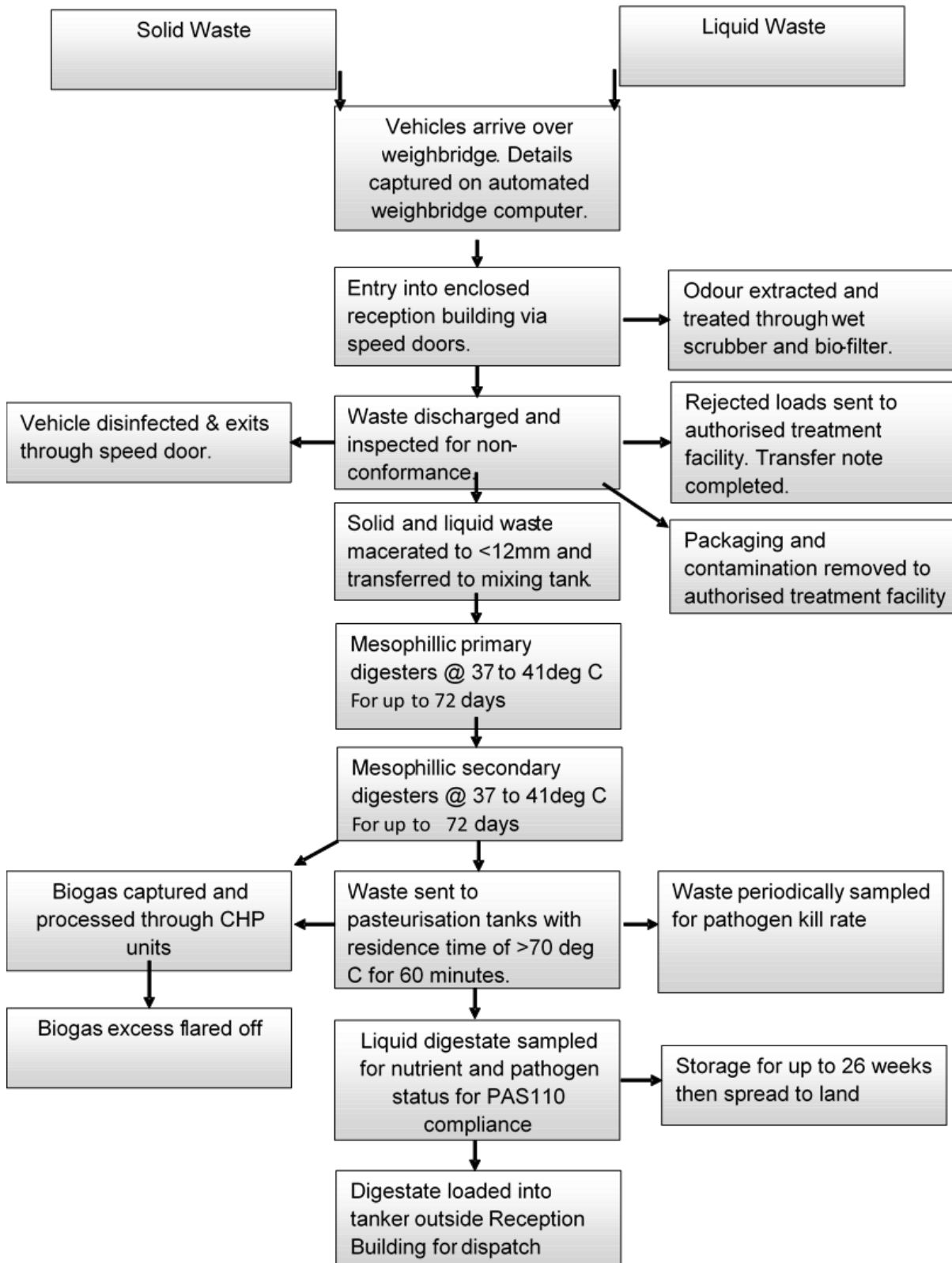
11.5. Emissions to land

There will be no point source emissions to land from the permitted activities on site.

12) EPB3: Question 3 – Operating Techniques

12.1 Process description

Figure 1 Process Flow



Reception

Solid Waste

Solid waste can be delivered to the site in a wide range of vehicles (mainly RCV's and HGV's). The delivery vehicle enters the site and is weighed over the weighbridge. It then proceeds to the enclosed reception building where access is gained through speed doors. The building is equipped with 2 recessed tipping bunkers to accommodate different waste streams and vehicle types.

Once inside the building, the door is closed to retain negative air pressure. This is to ensure any odour is controlled.

Solid waste is handled in a different manner to liquid wastes due to its drier consistency and potential for contamination, i.e. plastics. Solid waste is tipped into a reception bunker with a moving floor. Once the load has been tipped, the rear of the vehicle is washed down if necessary. The vehicle then exits through another speed door. The moving floor of the reception bunker conveys the solid waste to a screw conveyor. This lifts the material into one of the two macerators, which removes contaminants and reduces particle size, a requirement of the Animal By-Products Regulations (ABPR). Within the macerator solid material is mixed with liquid wastes and/or water to the required consistency. It is then pumped into a mixing tank.

Liquid Waste

Liquid waste is delivered in a tanker, entering the site over the weighbridge in the same manner as the solid waste. The tanker then connects to a discharge pipeline within the reception building and commences discharge to one of two underground storage tanks. Odours from delivering tankers are extracted from the building and treated through a scrubber and biofilter. Once the load has been discharged, a wash down of the rear of the tanker and the pipe work is carried out if necessary and then the tanker exits through another speed door. The speed door closes and the reception building regains negative air pressure.

Biofilter and Scrubber

The main body of the reception building is kept slightly below atmospheric air pressure. The air is extracted and treated through a water scrubber and wood chip and bark biofilter (which removes odours) before venting to the atmosphere. The liquid waste storage tanks and mixing tank, used to contain the wastes at the front end, are located underground and enclosed within the reception building to prevent odour release.

Energy Crop

Stabilising energy crop silage is stored on site in a silage clamp and is delivered to the energy crop feed bunker by loading shovel. The crop bunker is located next to the two primary digesters and comprises a moving floor and screw conveyor system which gradually feeds the silage into two of the digesters, providing a constant and controlled feed. This can help to balance the digester biology, as well as providing a good source of energy. All effluent from the energy crop storage area is directed to a submerged tank, this effluent is then pumped in to the Reception building and used as a process liquid.

Pre-Treatment

Pre-treatment and Blending

Pre-treatment is the most important phase to ensure problem-free and stable digestion that produces high gas yields, particularly when dealing with contaminated materials and animal by-products.

1. Screening

The solid waste may contain contaminants such as plastics and soft food waste packaging (inevitable in commercial and kerbside collected waste). It is undesirable for this material to enter the digester; therefore all material from the recessed bunkers are fed into one of two macerators. This specialist machine serves three purposes:

- Opening of soft and hard packaging, including plastics, paper, tins and glass;
- Removing plastics and other soft packaging via a separate contras discharge chute; and
- Reducing the particle size of all the material to below 12mm, to ensure maximum efficiency in gas release and Animal By-Product Regulations (ABPR) compliance.

The resultant thick, organic soup is pumped into a settling and mixing tank, where the small pieces of heavy contaminants (e.g. glass, grit, metals) settle out by gravity (in line with BAT).

2. Mixing

Liquid wastes are added directly to the macerators. The rate at which liquid waste is added will vary with the composition and dry matter of the solid waste. The higher moisture content and reduced viscosity enable the heavy contaminants to settle in the mixing tank to provide a de-gritting stage. This tank is periodically emptied by specialist contractors. The tank is continuously stirred using mounted SUMA stirrers to ensure consistency of product.

3. Control by Blending

Anaerobic conditions can be maintained and controlled by carefully blending the input material. Regular sampling and analysis from the primary and secondary digesters allows criteria such as pH levels and organic loading rates to be maintained at optimum levels. Feed-stocks are balanced to prevent inhibition of the biology and control gas production rates.

The facility is designed to accept a wide variety of wastes. To complement this, silage is used as a moderating feedstock. As well as providing stabilisation properties, silage also produces good gas yields and therefore a source of energy if waste inputs are not available (such as on public holidays).

Digestion

Digestion

The first phase of digestion is completed in the primary digesters. This is where the majority of the methane is extracted. Each digester has a capacity of circa 5587m³ and is stirred by 2 propeller stirrers situated on the sides of the circular tank.

Each tank is heated by a hot water system comprising stainless steel coils attached to the tank walls. As the biogas is released it is stored in the void above the digestion mass and is sealed by a twin membrane roof. The gas is kept at a low pressure by a moving roof membrane that fills and empties as the biogas levels rise and fall. The outer membrane of the digester is constantly air inflated, protecting the inner membrane elements from the weather.

The stirrers operate on a periodic basis in order to keep the digester contents moving in a sufficient manner to ensure that the mix optimises methane yield, but without excessive energy usage. Should one stirrer fail, the process is maintained by the other stirrers. During a planned shutdown, the stirrers are able to be lifted and replaced within 8 hours with minimal disruption to the process.

The substrate is displaced from the primary digester by the pumping regime and fed into the secondary digester. On leaving the primary digesters it passes through a macerator. This ensures that the particle size is less than 12mm in one plane in order to comply with the pasteurisation requirements of the ABPR and reinvigorates the digestion process, aiding breakdown of substrate and releasing the remaining biogas.

The substrate in the secondary digester is stirred, but with less intensity than the primary digesters. All digestion and storage tanks serve as gas holders. There is sufficient storage within the top of each tank for 8 hours of un-replenished production of biogas. In reality, the ongoing biogas production means that the gas available to the engines, if all feeding were to stop, would be sufficient to last for several days, but at reduced levels.

Pasteurisation

Pasteurisation

Pasteurisation of the digestate is carried out in order to kill potential pathogens within the food waste and achieve ABPR compliance. To be compliant, all animal by-product material must be reduced to a particle size of below 12mm (which is achieved in the macerator system as described above) and held at a temperature of 70°C for a minimum of one hour.

Agrivert employ post-digestion pasteurisation with the following advantages:

- All feedstock within the plant, including energy crop silage (which is added directly to the digester, separately from the food waste), is pasteurised, which is best practice for achieving PAS110 standard and AD Quality Protocol (an industry-standard quality assurance accreditation).
- The digestion process will eliminate many pathogens that may be present in the organic waste feedstock, reducing the burden on the pasteurisation stage.
- The waste material will be heated in the digester to >40°C, so less time and energy will be required to raise the temperature to >70°C for pasteurisation.
- If a problem were to arise with the pasteurisation system, the digesters would continue to operate normally (receiving waste) until the problem was resolved.

The material from the secondary digester tank is introduced into one of three pasteurisation units in batches. Batching ensures that nothing is despatched to final storage without being fully pasteurised.

The three pasteurisation units are heated using some of the heat from hot water from the gas engines. Once the pasteurisers are at + 70°C, the tank is held at this temperature for a minimum of 1 hour. An auxiliary boiler can be brought in to ensure compliance with the ABPR is always achieved in the unlikely event of two pasteurisation units failing. The automated system ensures that waste does not leave the pasteurisation units until temperature has been achieved for the required time. This is recorded electronically and can be audited by the Animal Health and Veterinary Laboratories Agency at any time.

There are three temperature probes inside the units to monitor the temperature and ensure temperature is achieved for the entire period. The unit is equipped with stirrers which ensure the batch is consistently stirred and that no cool zones are able to develop. Once temperature has been achieved, the batch then passes onto storage. Sampling points for ABPR purposes are provided at the inlets and outlets of all three pasteurisation unit.

The ABPR represents such a critical element of the process that the three pasteurisation units consist of two duty and one assist / standby pasteurisation unit. Two of these tanks are capable of pasteurising the entire input feedstock of the plant.

Energy Production

Energy Production

The biogas produced by the digesters is naturally high in sulphides. Sulphides are a problem for gas engines and must be reduced where possible. The first stage of reduction is carried out within the digesters where there are three forms of sulphide control:

- Limited amounts of oxygen are allowed into the methane store, in order to oxidise some of the sulphides;
- Ferrous Chloride is added periodically to the digester to enable the sulphides to become sulphates, which produces a complementary sulphate solid trace fertiliser; and
- A net is suspended across the top of the digesting liquid on which sulphur crystals grow. As they gain sufficient weight, they fall from the net into the liquid and remain in their solid form rather than exiting the digester as a gas. This elemental sulphur which drops into the digestate improves its fertiliser value.

Once these three stages have been completed, the biogas has had a significant reduction in overall sulphur content and is normally ready for use in the gas engine. However, to ensure optimised levels of sulphur, all biogas is 'scrubbed' through an automated carbon filter. The biogas is dehumidified and compressed prior to introduction into the carbon filter.

The Gas Engine

The gas engines are carefully sized to operate at maximum efficiency and to create the necessary power. Such gas engines are very reliable but have comprehensive maintenance agreements in place to minimise downtime. The gas engine receives the biogas and uses it as a fuel in powering a conventional generator unit to produce electricity. The output of the generator is dependent on the draw of biogas (and the resulting rpm of the gas engine). Should there be too much biogas for the gas storage and the gas engine, then it is flared at a remote flare stack. If this is a persistent issue, then additional gas engines can be added to increase electricity production.

The hot water from the gas engine cooling system and exhaust gas heat exchanger is used to heat the pasteurisation units, to keep the digesters at the required temperature for mesophilic digestion and to dry the biogas.

Excess heat can be utilised in a variety of manners dependent upon location, for example it could be used to heat nearby greenhouses or other industrial buildings or converted into additional electricity via heat exchangers on the exhaust stack. The gas engine exhaust is piped through a flue that rises on the outside of the insulated container. The noise of the gas engine is suppressed within a sound insulated engine container. The power generated by the gas engine is transmitted directly into the National Grid via transformers and a high voltage connection.

Digestate Storage and Recycling

Digestate Storage

The facility will provide digestate storage capacity of 5587 m³. This will be supplemented with off-site storage, capable of storing up to 6 months' worth of digestate. This is because it can only be spread to land at certain times of the year, and is considered in accordance with BAT.

Recycling

Sealed tankers are used to transport the digestate from the site to be spread to land or to farm lagoons for storage.

When the season and weather are suitable for recycling to land (respecting the Nitrate Directive), the digestate is applied using specialised spreaders.

Application rates are strictly monitored in accordance with the requirements of the crop, and to comply with the Nitrate Vulnerable Zone (NVZ) regulations. The digestate is a valuable bio-fertiliser, with a higher rate of first year nitrogen availability than many organic fertilisers. It also contains valuable sources of potash, phosphate and sulphur. The main spreading seasons are in the spring, the late summer and autumn. This is to coincide with the cropping windows where nutrients are most required and soil conditions are most appropriate.

12.2. Chemical Reactions in the anaerobic digestion process

Food waste is converted into digestate and biogas through a mesophilic biological digestion process.

Initially this is done through the hydrolysis and fermentation of the cellulosic, protein and lipid compounds in the waste by micro-organisms (anaerobes). Carbohydrates, proteins and lipids are hydrolysed to sugars which are then further decomposed to carbon dioxide, ammonia and also carboxylic acids and carbon dioxide.

At later stages, the organic acids formed in the hydrolysis and fermentation stage are converted by acetogen micro-organisms to acetic acid, acetic acid derivatives, carbon dioxide and hydrogen. Other organisms convert carbohydrates directly to acetic acid using carbon dioxide and hydrogen.

Finally, micro-organisms (methanogens) convert these organic acids and their derivatives into methane and carbon dioxide.

This process requires heat to maintain the biological activity, which is provided by the CHP gas engines through a heat exchanger system.

12.3 Types and amounts of raw materials

Table 11 Types and amounts of raw materials

Description of raw material and composition	Maximum amount stored	Annual throughput	Description of how the raw material is used	Justification /Viable alternatives	Fate	Any main hazards	Environmental Impacts
Ferrous Chloride	35 m ³	Approximately 100-300 tonnes	Added periodically to convert sulphides (which are not desirable for the gas engines) into sulphates.	Ferrous Chloride was selected to convert the sulphides into a useful product; a complementary sulphate solid trace fertiliser.	Digestate	Corrosive, causes burns	Slightly toxic to living resources
Silage	3000 tonnes	Up to 8,000 tonnes	Used as a moderating feedstock in the AD process, and to replace waste inputs in the event of an unplanned disruption to waste deliveries. This material enables higher gas yield and is an important balancing agent within the AD process.	Agrivert has great experience in utilising this material at other digestion plants. Feedstock is supplied by Agrivert.	Digestate	None	Silage leachate may be hazardous for aquatic environment due to high nutrient content leading to eutrophication. Stored in the bunded area.
Biogas Methane (60-65%) Carbon dioxide (35-40%) Other (<1%)	Approx. 9142 m ³	8,585,063 m ³	Combusted to produce electricity and heat. Biogas was selected as fuel because it is readily available as a by-product of the anaerobic digestion of food and green waste	No alternative – the purpose of the plant is to produce energy from biogas	Electrical and heat energy Air emissions of carbon monoxide, carbon dioxide, sulphur dioxide and nitrogen oxides	Extremely Flammable, Harmful if inhaled	Can cause odour issue if released Renewable energy production. Reduction in global warming impact by conversion of methane (GWP 23) into carbon dioxide (GWP 1).

Lubrication Oil Mineral Oil (100%)	5000 litres	Approximately 8000 litres/unit/year	To reduce friction between moving surfaces in engine	Use in accordance with engine manufacturer specification	Waste recovered –	None	May cause physical fouling of aquatic organisms. Minimisation of environmental impact through recovery. Stored in secondary contained tank
Transformer oil Highly refined mineral oil (100%)			To reduce friction between moving surfaces in engine	Should oil require replacement appropriate replacement options will be assessed	Waste recovered –	None	May cause physical fouling of aquatic organisms. Minimisation of environmental impact through recovery
Water	5m ³ scrubber water tank 400m ³ Rainwater Harvesting Tank	Up to 10,000 m ³	Use in the process	Main water will be used to top up 5m ³ scrubber water tank Rainwater will be recovered and used in the process. It is being considered to use a borehole if the amount of water from the rainwater harvesting is insufficient.	Digestate	None	None

12.4 Engines In-Process Control

The immediate control of the CHP units will be by manual and automatic engine tuning for optimum engine combustion conditions. This will be supported by continual performance monitoring and maintenance which will indicate when a CHP unit falls out of the required operational specification. When this occurs, corrective action will be implemented, either by remote control or site attendance. The maintenance regime for the units will ensure that maximum availability is achieved.

Agrivert will contract the management operation of the engines at North London AD, this is envisaged to be contracted to Clark Energy who undertake management of all Agrivert's CHP's.

All regular maintenance will be completed according to the time scale specified by the equipment manufacturer. A high level of preventative maintenance is designed to avoid unscheduled down time, maximising the plant availability and its ability to control emissions and maintain an efficient level of operation between overhauls. The record sheets completed would highlight any issues that may require operator intervention outside the routine maintenance programme.

Work at the plant will only be carried out by trained, electrical and mechanical specialists. It is possible to conclude service contracts with GE Jenbacher, their subsidiaries or authorised and specialised companies. As part of this contract, the maintenance contractor will remove any waste generated by the maintenance activity for appropriately licensed recycling and/or disposal.

12.5. Venting and Control Measures for Abnormal Conditions

Venting and Emergency Relief

During normal operation of the plant gas is fed into the engines at approximately the same rate as it is generated. There is sufficient capacity within the gas storage roofs to manage the natural daily fluctuation in gas production. In the event that there is more gas being produced than can either be fed or safely stored, the Flare Stack is used on site to control gas build up in the event that the gas generated exceeds the capacity of the gas engines (for example, in the event of engine failure).

Excessive gas build-up is an abnormal condition and does not arise during normal operation of the plant.

Protection during abnormal operating conditions

The site Control System provides early warning of abnormal operating conditions, for example level sensors in the tanks will detect leaks or overfilling. Control measures are in place for leaks or overfilling include secondary containment, a leak detection membrane around each tank and isolation of leaks by closing valves.

In the event of engine malfunction or breakdown, the site Control System will immediately telephone the site manager, who will in turn contact the contractors responsible.

The digesters, due to the nature of the biological processes require continual supply of waste material and as such do not undergo temporary stoppages or shutdowns.

In the event of pasteuriser malfunction or breakdown, the current batch of digestate is held inside until the pasteurizer until it can resume operations.

12.6. Drainage philosophy

Surface Water Drainage Arrangements (Water Management Plan)

It is a requirement under Environment Agency Standard rules SR2012 No11 (Anaerobic digestion facility including use of the resultant biogas) that the anaerobic digestion sites are designed to incorporate an impermeable layer across the site to ensure that there is no potential for contaminants to be released into sub surface aquifers or into surface waterways should a tank rupture. "All storage and process tanks shall be located on an impermeable surface (a permeability of at least 10^{-9} m/s) with sealed construction joints within a bunded area. The bunded area shall have a capacity at least 110% of the largest vessel or 25% of the total tankage volume, whichever is the greater." Agrivert's bunds are designed to CIRIA C736 standards with the required level of impermeability (1×10^{-9} m/s) and incorporate sealed construction joints with secondary containment and leak detection; this is considered BAT for containment.

Agrivert's AD plants are designed to ensure that any liquid that falls within the site is contained within either a sealed and lined tank or within an impermeable bund. All of Agrivert's tanks are constructed from cast in-situ concrete and incorporate a leak detection membrane; this ensures the robustness and integrity of each tank (mixing tank, liquid tanks, digestion and storage tanks) and greatly reduces the risk of tank rupture when compared to metal tanks. We consider that in relation to tank construction, cast in-situ concrete tanks represent BAT.

In terms of pollution caused by on-site liquids, the use of concrete tanks ensures that any material which may have the potential to contaminate surface water is stored securely within their respective tanks (i.e. material which is classified ABPR). The leak detection membrane also ensures that staff can visually assess whether a tank is leaking. They can then quarantine this tank and remove the material from it to a suitable treatment plant. This means that any material falling on to the roofs of buildings and on to the concrete roadways and within the bund can be classified as non-contaminated liquids.

Non-contaminated rain water will fall within the bund and will be stored here until such a time as it can be pumped in to the Rainwater Harvesting tank. The bund shall be regularly inspected to ensure that it is regularly emptied. Connections and fill points will be within the bunded area and no pipework should penetrate the bund wall. Underground tanks shall have secondary containment with appropriate leak detection."

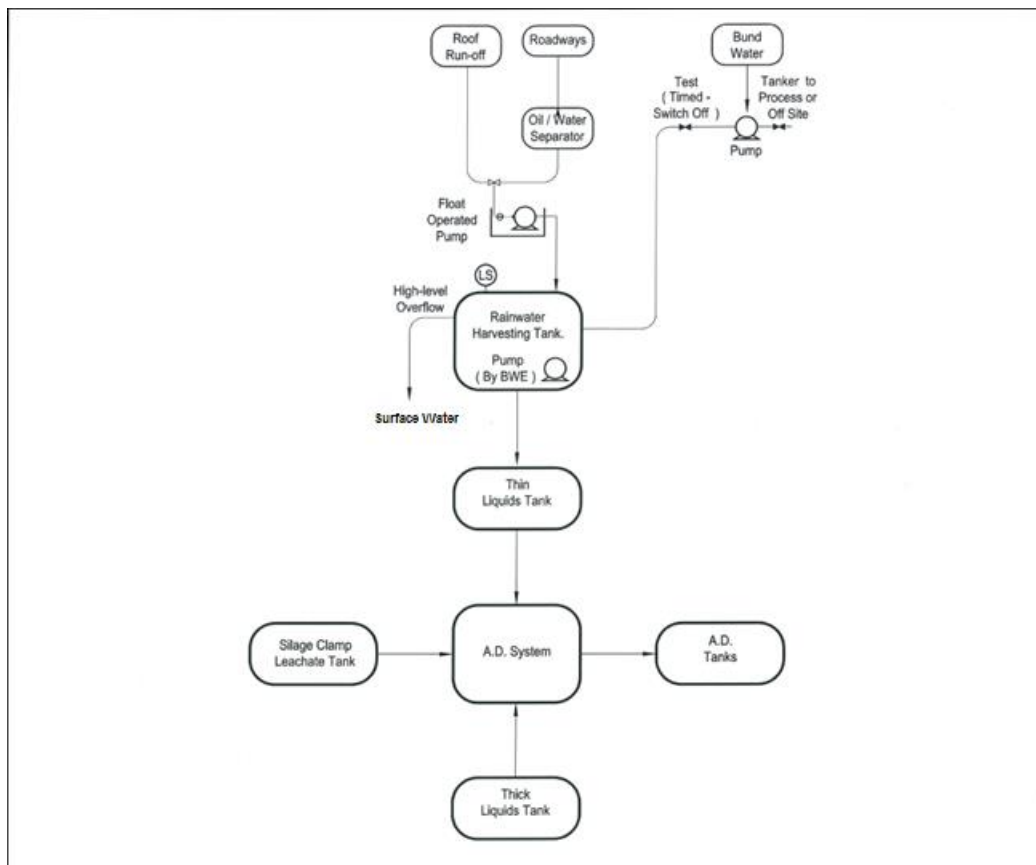
Along with the impermeable surface of the bund, the topography within it takes water to sump points where it can be managed.

The weighbridges will be level access as vehicles enter the site with a ramp down into the bund as they drive off the weighbridge towards the Reception Building. The whole site is therefore effectively within the bund.

The Anaerobic Digestion process requires a significant quantity of water (up to $150\text{m}^3/\text{day}$) to keep waste moving through the system. The design of the bund and the site drainage system ensures the retention of all rain water flow on site for use through the process. Liquids are an important part of the AD process which is the reason why Agrivert will look to retain a suitable volume of rainwater within the site.

A Drainage Flow Chart has been prepared to illustrate the sites drainage arrangements and can be seen in Figure 2 below.

Figure 2 - Drainage Flow Chart



Contamination

Agrivert’s facilities are designed to ensure that contaminated liquids are stored within sealed tanks with leak detection. It is considered that the only potential for contamination of surface water within the site comes from either the contents of a tank leaking or from the spillage of fuels. These have been discussed in more detail below.

Contaminated Liquids

The biodegradable material in the system falls under the Animal By-Products Regulations until pasteurised and is the major potential source of contamination on-site other than hydrocarbons from Roadways and Car parks.

All ABPR material is stored within sealed concrete tanks with leak detection which ensures both primary and secondary containment and greatly reduces the potential for any ABPR liquid to escape from the tank. More detail in relation to tank failure is set out in Worst Case Scenario Section Below.

All liquids that fall on to the roadways are passed through a CONDER CNS B Hydrocarbon Separator prior to being fed into the Rainwater Harvesting tank.

An underground Silage Effluent tank will capture any run off from the silage clamp and surrounding aprons. The silage clamp is designed to comply with SSAFO regulation requirements to ensure that all effluent from the clamp is diverted towards the tank. The leachate tank has been sized as per SSAFO plus additional volume to accommodate rainfall falling on the areas immediately surrounding the clamp.

In terms of spillages of vehicle fuel through an accident on site, spill kits are kept on site. In addition all yards and roadways drain to the hydrocarbon interceptor before entering the Rainwater Harvesting tank from where it is used through the process. In the event of minor spillages from vehicles on grassed areas, the impermeable surface and highly bunded site ensures the potential for contamination to leave the site is low.

Non-contaminated Liquids

All rainwater falling on to the roof of the Reception Building will be directed towards the Rainwater Harvesting tank where it will be stored prior to being utilised within the AD process. It is considered that the potential for this to become contaminated is extremely low given the lack of opportunity for rainwater to come in to contact with contaminants.

All water on-site is therefore predominantly clean rainwater and the bund acts as attenuation for the rainwater falling within it; this is then pumped to the Rainwater Harvesting tank by a key switch operated, timer controlled pump.

A fertiliser end product is produced through the AD system. This has been pasteurised in accordance with the ABP Regulations and is no longer considered to be a waste under the EU End of Waste Criteria. This is metered into road going tankers within the bunded site and taken off site in sealed tankers either to the field for immediate spreading or to secondary storage on farm lagoons.

Worst Case Scenario – Tank Failure Event

Agrivert designs its tanks in accordance with Best Practice and utilises cast in situ concrete tanks which we consider ensure the integrity of the tank throughout the operational period of this facility. All of the tanks are fitted with a leak detection membrane which surrounds the base and the sides of the tank to above ground level. The site staff check the leakage ports across the site weekly. Should any material begin to leach into the space between membrane and tank the site staff would note an increase in level. They would then be able to sample and test the liquid to determine if it was groundwater or a leak from the tank. If it was from the tank then they would be able to isolate that tank, remove any liquid within it and undertake any repairs. In the unlikely event that it was groundwater, then they could install a submersible pump with float switch to extract it into one of the site liquid tanks. The volume of flow through this route could be regularly monitored and tested to ensure that it remained purely groundwater and within manageable proportions. In this way the leakage would be managed as an inward flow ensuring no contamination to groundwater.

The base of the digester/storage tanks are constructed at a depth of approximately 600mm below existing ground level. A layer of sand is laid to create an even surface; this is then covered with a layer of insulation, followed by a layer of leak detection membrane and a thin binding layer of concrete to create an even foundation for the reinforcement. Steel reinforcing bars are then constructed to create a mesh which acts as reinforcement for the

cast in situ concrete. A PVC water bar is cast into the concrete base at the wall joint location to ensure there are no leaks when completed. Structural damage to the tanks is unlikely and during operation the levels of the tanks are monitored via a computer system. Since all tanks are the same size this checks that the drop in level of one tank equates with the rise in level of the receiving tank. Any discrepancy will prompt investigation.

Agrivert have successfully utilised identical tanks at all of its AD sites and have never had a containment issue in the leak detection membrane. Agrivert are unaware of any incidents involving cast in situ concrete tanks within our Industry and as such this is considered BAT and further considered that it is highly unlikely that tank failure will occur.

In the unlikely event of a tank failure resulting in contaminated liquid escaping from the tanks then it would be contained within the bund. A vacuum tanker will be used to extract this material from the sumps within the bund. The material will then either be reprocessed on site by introduction through the Thin or Thick Liquid tanks or disposed of at a suitably licenced facility. Agrivert carries out routine testing on the biology of all tanks and in the event of an incident the microbial content would be known.

Rainwater Harvesting Tank

1. The Rainwater Harvesting tank on-site is used for the purpose of using the collected rainwater from the site within the AD Process.

The Rainwater Harvesting Tank receives the clean Bund Water via a timed pump, Roadways water via a float operated pump after passing through an Oil/Water Separator and Roof Run off water via gravity feed.

Whilst the potential for rainwater to come in to contact with contaminants is negligible, the Rainwater tank is sampled and checked at regular intervals for ammonia as a tertiary pollution prevention measure. Should any ammonia be noted within the tank then its overflow will be closed until the tank contents have been used through the AD process or tankered off site to a suitable secondary treatment facility. Should the reading show no sign of ammonia then this water will be free to discharge in the event of an overflow, through a restricted outlet which will control the rate of flow to a watercourse thereby providing a quaternary level of protection.

The rainwater harvesting tank will be fitted with a high level alarm. This serves to alert the site manager to any potential discharge to the surface water. The high level alarm will initiate the sampling system described above.

The water within the Rainwater Harvesting tank can take one of two pathways;

1. To Thin Liquids Tank
2. High Level Overflow to Surface Water

1. Thin Liquids Tank

The thin liquids tank (within the Reception Building) has a leak detection membrane. The Anaerobic Digestion process requires a significant quantity of water (up to 150m³/day) to

keep waste moving through the system and the Thin Liquids Tank holds the lower viscosity liquids to enter into the AD System. The clean water within the Rainwater Harvesting Tank will be pumped into this tank for use in the system.

2. High Level Overflow to Surface Water

In the event of the Rainwater tank overflowing the clean water will discharge to surface water course through a restricted outlet which will control the rate of flow. A discharge consent will not be required as it is clean rainwater.

Bund Water

The bund design is in accordance with CIRIA C736 which among other things requires a level of permeability of $1 \times 10^{-9} \text{m/s}$. This criteria means that with a 0.1m layer of impermeable material it would take ≈ 3.2 years for contamination to pass through it and reach groundwater. We operate a clean bund policy which means that any contaminating spill will be cleaned up as soon as possible which usually means within a few days.

Rainwater falling on the bund will not leave the area until it is visually checked for turbidity and pH. As set out earlier, given Agrivert's design principles there is negligible opportunity for contaminated material to come in to contact with bund water. Should a change in colour of water be identified on site the site manager will immediately begin testing. Testing prior to pumping is the responsibility of the Site manager who is responsible for the whole site and compliance with the Permit. Any contaminated water will either be recirculated through the process or tankered off site to a secondary treatment location. Agrivert will ensure that on site operations throughout the duration of this contract do not give rise to any form of contamination at surrounding watercourses.

As the intent is to use the water for process, the Rainwater Harvesting Tank is likely to be empty most of the time.

Following testing of the bund water it can leave the bund via a pump in two ways;

1. Timed Switch (if uncontaminated to Rainwater Harvesting)
2. Tanker to Process or Off Site (if contaminated or liquid tanks are at capacity)

1. Timed Switch

Following the checks for contamination; if the bund water is clean the pump will take water from the bund to the Rainwater Harvesting tank. This pump is on a key switch which activates a timer. The timer will run for 10 minutes, so that if forgotten about, the pump will be switched off automatically to avoid transferring un-checked and potentially contaminated water.

The system proposed is safer than having a shut off valve as it relies on a timer switch to run the pump. It fails safe, while a pen stock or similar valve must be closed by someone. Pumping using a timed operation limits the risk of a large scale event and provides additional

buffer capacity to ensure no pollution escapes the site. Agrivert have operated identical AD sites for over 5 years with similar drainage philosophies and without incident and as such we feel this is BAT. It eliminates the potential for human error associated with manual shut off valves; which may be forgotten about.

2. Tanker to Process or Off Site

Following the checks for contamination; if the bund water is found to be contaminated or there is insufficient capacity within the Rainwater Harvesting tank, then a temporary above ground pump will take it directly to the Thin Liquids Tank within the Reception Building for processing within the AD system. If there was insufficient capacity for it within the Thin Liquids Tank then it would be disposed of by a suitably licensed carrier and disposal facility. This would be an extremely rare event as we operate with no leaks into the bund for any prolonged period.

Roadways

The Roadways water is retained on site and passed through a hydrocarbon interceptor (Oil / Water Separator) for reuse in the AD System. The water is monitored as hydrocarbons will inhibit the anaerobic digestion process. The water from yard and roadway areas will flow through the hydrocarbon interceptor then to the Rainwater Harvesting tank before being pumped to the Thin Liquids Tank. There are no direct roadway drains off site.

The interceptor to be used for road drainage at the site is proposed to be a CONDER CNS B Bypass Separator details of which can be seen in **Attachment 11(i)**. This interceptor was decided upon based on Pollution Prevention Guidelines 3 for the Risk of infrequent light contamination and potential for small spills only e.g. car park.

The separator will fully treat all flows, for the area served, generated by rainfall rates of up to 6.5 mm/hour (≈ 1 in 30 years). This covers most rainfall events. Flows above this rate are allowed to bypass the separator and flow into the Rainwater Harvesting tank.

In terms of spillages of vehicle fuel through an accident on site, spill kits are kept on site in the event of minor spillages but the impermeable surface and highly bunded site ensures the potential for contamination to leave the site is low. This would ensure that nominal amount of contamination can make its way in to the roadway drainage system and the Separator has been designed to accommodate this type of event.

Roof Run-Off

Rainwater run-off from the Reception Building roof will also be collected for use within the AD process. Down pipes from roof gutters would discharge into underground pipes taking this water to an initial sediment chamber then in to the Rainwater Harvesting tank via gravity.

Other Flow Chart Explanations

Other features on the Drainage Flow chart (as seen in figure 2) are explained below;

Silage Clamp Leachate Tank

The Silage Clamp Leachate Tank is housed underground below the Silage Crop and collects the run off of the crop. The site is designed to ensure that this effluent flows towards the tank

and does not drain into the bund. This tank is encased in a leak detection membrane with inspection port as per the above ground tanks.

Thick Liquids Tank

The Thick Liquid Tank receives liquids which are high viscosity and this feeds into the AD System via the Reception Tank. The Thick liquid tank is located within the Reception Building, is constructed from cast in situ concrete with a leak detection membrane.

AD System

The AD System is the processing system for the food waste. It consists of a Reception Tank which blends the thick liquid and food waste slurry from the hammer mill. The Reception Tank is encased by a leak detection membrane with inspection port.

AD Tanks

From the Reception Tank a pump takes the blended waste to 4 tanks which contain the substrate for digestion (2 Primary Digesters, 2 Secondary Digesters). After digestion the digestate is pumped to the pasteurisers and then on to the Storage Tank. These tanks are all within the impermeable bund area and their bases are individually wrapped with leak detection membranes.

Foul Water

Foul water from welfare facilities is not included on the Drainage Flow Diagram as it has no connection to any part of the Surface Water Drainage Arrangements. The foul water from the welfare facilities comprising 2 toilets (male and female/disabled) and two showers will go to a Bio Disc BE-BL made by Klargester (its specifications can be seen in **Attachment 11**). The package sewage treatment system and has been appropriately sized for the site and can cope with greater numbers than the staff and visitor numbers to the AD facility. Following treatment the foul water from the site will then connect to the wider Coursers Farm network.

Surface Water Drainage Conclusion

As discussed within the previous sections, Agrivert facilities are specifically designed in accordance with the appropriate British/ European Standards and best practice to ensure that they can be efficiently operated to the highest environmental standards. Agrivert's tanks are constructed from cast in situ concrete, to ensure their integrity remains intact throughout the duration of their operational life and have appropriate secondary containment through a leak detection membrane. The containment bund surrounding the site will be constructed to CIRIA C736 requirements in terms of impermeability and ensures that no surface water, whether it be contaminated or not, can access ground water sources.

Contaminated liquids are all contained within the AD process sealed concrete tanks. Underground substrate and digestate pipework is contained within bentonite lined trenches which gives 1×10^{-9} m/s containment if a pipe ruptures. The contaminated material is considered to be any ABPR material or any spillage of fuel from delivery vehicles. All ABP material is contained in sealed tanks with leak detection, in the unlikely event of the tank leaking, it would be quarantined and its contents removed and treated whilst maintenance is undertaken. Any fuel spillages will be treated using on site spill kits.

As set out above, any water falling on the site (within the Bund or on to the roof of the Reception Building) is considered to have a negligible potential to be contaminated and is such deemed as being non-contaminated liquid. This liquid is stored within the bund or within the roadway system before passing towards the rainwater harvesting tank; from here it is then directed towards the AD system. The AD process may require up to 150m³ of liquids each day and therefore it is unlikely that there will be any need for discharge out of the site. However as advised earlier, this will be clean water and as such Consent will not be required.

Foul water will be directed to an existing sewage network within the Coursers Farm site. The water, which will be solely generated from within the site office compound will pass to a Klargestar and then on to the wider sewage network.

It is therefore considered that through robust site design, the potential for contaminated liquids to come in to contact with uncontaminated liquids is negligible and that the proposed water management plan strives to achieve BAT through all processes.

Tank Bunding Calculations

Tank bunding calculations are contained in Table 12 below and summarised as follows:

- 25% of the volume of all tanks above ground on site is 7,537 m³.
- 110% of the above ground capacity of the largest tank is 6,633 m³.

The required bunding volume is therefore defined by 25% of the total tank volume since it is the larger.

The designed bunded area which forms a continuous bund for the AD plant tanks is defined below:

Total bunded area based on the circumference of the bund half way up the inner bund side = 19,868 m²

Built development (containers, silage clamp, buildings etc.) which displace containment capacity total 3,315 m²

25% of total tank volume = 7,537 m³. Therefore 2 tanks would have failed and their base area would be available as containment. The base of the remaining 3 tanks displace containment capacity totalling 2,504 m².

Therefore, total area available for containment

$$= 19,686 - 3,315 - 2,504 = 14,049 \text{ m}^2.$$

Since the total bund area available is 14,049 m² and the volume to be contained is 7,537m³ then the average bund wall height would be 7,537/14,049 = 0.536 m.

Additional capacity for a 10 year return period rainfall event, in line with the C736 guidelines, requires 0.050m. C736 also requires 0.75m, for dynamic affects associated with a tank failure, giving a total of 1.336 m.

Table 12 – Tank Bunding Calculations

Description	Units	Primary Digester 1	Primary Digester 2	Secondary Digester 1	Secondary Digester 2	Storage 1	Total
Tank number		1	2	3	4	5	
Type		RC	RC	RC	RC	RC	
Location		Above ground	Above ground	Above ground	Above ground	Above ground	
Internal Wall Height	m	8	8	8	8	8	
Internal Diameter	m	32	32	32	32	32	
Internal Base area	m ²	804	804	804	804	804	4,164
Gross Internal Volume	m ³	6,434	6,434	6,434	6,434	6,434	33,029
Freeboard	m						
Freeboard Volume	m ³	0	0	0	0	0	
Central Column Diam.	m	0.6	0.6	0.6	0.6	0.6	
Volume of Central Column	m ³	2.3	2.3	2.3	2.3	2.3	
Useable Volume	m ³	6,432	6,432	6,432	6,432	6,432	
Top Surface of Base below finished Ground level	m	0.5	0.5	0.5	0.5	0.5	
Volume below ground level	m ³	402	402	402	402	402	
Spillable Tank Contents	m ³	6,030	6,030	6,030	6,030	6,030	30,148
Bunding required at 25% of total volume	m ³						7,537
Bunding required at 110% of largest tank	m ³	6,633	6,633	6,633	6,633	6,633	< cf ^
Tank Wall Thickness	m	0.30	0.30	0.30	0.30	0.30	
External Tank Base Area	m ²	835	835	835	835	835	4,173
Tertiary Storage Volume	m ³	0					
Av Bund Height Reqd	m	0.536	25% Total		6,633 110% Largest	7,537 25% Total	
C736 Freeboard	m	0.75					
C736 Rainfall event	m	0.05					
Overall Bund Height	m	1.336					
Area required for bunding	m ²						14,049
Area available for bunding	m ²						19,868
Built development such as silage clamp, containers, building etc. within bund	m ²						3,315

* RC – Reinforced Concrete

The CHP units located within this area have their own self-contained bund.

13) EPB3: Question 4 – Monitoring

13.1. Point source emissions monitoring to air (Please refer to Attachment 4 Site Plans (iii) - Permit Boundary Point Source & Emissions

Emission point reference	Parameter	Proposed monitoring technique	Frequency
A1 A2	Nitrogen Oxides	Independent testing (third party contractor, MCERTS certified)	Annual
	Sulphur Dioxide		
	nmVOCs		
	VOC		
	Carbon Monoxide		

Monitoring of emissions will be compliant with Technical Guidance Note M1.

Moreover, regular monitoring of the engine emissions for CO and NO_x will be conducted under the maintenance regime using hand held meters (e.g., Testo meters). This is essentially the combustion calibration check to ensure correct set-up of the engine combustion conditions for optimum efficiency and emissions. All data acquired will be recorded and held available for review by the Agency during routine compliance inspections.

There is no monitoring proposed for other point source emission points to air.

Sampling Assessment

Sampling will be carried out using mobile access platform

- Safe access – via mobile access platform
- Access for equipment – via mobile access platform
- Space for equipment & Staff – mobile access platform sized to provide suitable reach
- Provision of essential services i.e. electricity – electricity is located within close proximity

Monitoring of Engines operation

To control the combustion within the engine an electronic engine management system is used. The key parameters recorded by the control systems that are used to manage the operation of the CHP (and hence may be considered to be surrogate environmental monitors) are summarised below:

- biogas flow;
- methane content of biogas;
- oxygen content of biogas;
- hydrogen sulphide content of biogas;
- gas pressures;

- cylinder temperatures and pressures; and,
- oil temperature and pressures.

These measurements are used by the engine management system to adjust the engine ignition timing, air flow from the turbocharger and temperatures in the system. The engine is designed to operate in lean burn mode thereby reducing emissions of oxides of nitrogen (NO_x). If any of the measured process parameters exceeds levels specified in the process control manuals, an alarm is raised and the operators informed. In a serious fault condition (low biogas pressure, electrical distribution failure), the plant would shut down to prevent uncontrolled emissions and the biogas would automatically divert to the adjacent flare. For less serious fault conditions, once the fault is cleared, the engine would automatically restart. If the alarm is raised, the automatic telemetry will contact the operator and maintenance contractor to inform them of the fault condition.

If the gas flow or methane content is sufficient, the plant will operate normally. If there are problems with fuel supply or maintenance of the engine, the flare would be used.

During start up and shut down, engine emissions may change but the time taken for the plant condition to stabilise is relatively short, and any peak emissions would therefore also be short term. Typically the engine takes 15 minutes to reach stable operating conditions from a cold start. Start-ups will be relatively infrequent events owing to continuous running under normal circumstances.

13.2. Point source emissions monitoring to sewer

The Site cabins and welfare facilities will be discharged to the package sewage treatment plant seen in **Attachment 11(ii)**. No monitoring is proposed for this release as it is well within the capacity and capability of the package sewage treatment plant.

13.3. Monitoring of Process Variables

Process variables will be continuously monitored as they are critical to the efficient operation of the Anaerobic Digestion.

The site Control System (a bespoke computer program) will allow the Site Manager and Operatives to monitor and control operations on site (both during site operational hours and remotely outside of operational hours).

The following list, which is not exhaustive, illustrates the type of site processes that are monitored and controlled by the system.

- Liquid and biogas levels
- Biogas quality
- Pressure in storage and digester tanks
- Pumping plans
- Feed-in plans
- Generation and consumption of biogas
- Oxygen and Methane levels
- Water temperature
- Pasteurisation
- Stirrer controls in storage and digester tanks
- Temperature
- Gas Engine productivity

When predetermined levels are reached, the Control System will generate a warning message (for example, pump failure, high methane content, flare coming in to use in) which is immediately sent to the Site Manager's phone. The Site Manager will then contact the relevant contractor to rectify the issue.

14) EPB3: Question 6 – Resource efficiency and climate change

14.1. Energy Efficiency

Efficiency in Energy Generation

The AD process converts the chemical energy in the food waste into chemical energy of the biogas, which is then changed into heat energy and electrical energy by the CHP engines.

Agrivert has selected to install 2 new Jenbacher 420 GS-B.L spark ignition engines for the facility with a nominal electrical output of 1.487 MWe and thermal output of 1.480MW

The equipment used for power generation on the proposed site has the following features to provide Best Available Technique for energy efficiency:

- Sized to operate at maximum efficiency
- High working temperature difference
- High percentage of fuel combustion
- Comprehensive maintenance agreements in place to minimise downtime

When running at 100% capacity and at start up, the two engines consume a total of 7016 kW of energy input.

The performance data show that each new Jenbacher unit has an efficiency of 84.6% (42.4% electrical and 42.2% thermal) operating at full load.

There are only limited data against which to benchmark the performance of spark ignition engine CHP units. On this basis, and in light of the fact that the efficiency of these units is comparable with other similar units operating elsewhere on similar duty, such a benchmarking exercise is not considered necessary. However, comparison of this technology to other available options shows that spark ignition engine CHP units are the most efficient option for this particular application (as discussed below).

Agrivert chose to install spark ignition engines at this site as these are considered BAT for the conversion of biogas to electricity when compared to Gas Turbines and Compression Ignition Engines. Gas turbines cannot produce the electrical efficiencies of spark ignition engines for this operational scenario. Typically, a gas turbine will only produce an electrical efficiency of approximately 23% at 75% load, whereas a spark ignition engine will produce around 40%. Further to this, gas turbine recovered heat characteristics are not suitable for heat provision to the digesters because the temperature is too high. This makes gas turbines less of an appropriate option for this particular application. Compression ignition engines are very similar to spark ignition engines. However, they have a lower heat recovery potential and higher capital cost (SGN S1.01, Combustion Activities, draft), which discounts them as an appropriate option.

Use of generated energy

It is expected that 28GWh of electricity will be generated per year. From that, 3GWh will be used within the permitted facility and the remaining 25GWh will be transmitted directly into the National Grid via a high voltage connection.

Hot water from the CHP gas engine cooling systems will be used in the following areas of the plant where it is necessary, greatly reducing energy consumption on site:

- 1) Pasteurisation tanks
- 2) Digesters (keeping them at the required temperature for mesophilic digestion)

Any surplus heat is cooled through standard cooling radiators.

A heat exchanger will be used to use heat from the output of the pasteuriser to heat up feed stock to the digesters.

In consideration of the Environment Agency's Horizontal Guidance Note H2 on Energy Efficiency Agrivert will regularly review their energy consumption at North London AD Facility. It is anticipated that the site's use of off-site energy will be greatly reduced once the plant has been fully commissioned and the plant can operate using its own generated electricity.

In addition consideration may be given to integrate waste heat into the other businesses located on Coursers Farm and the Tyttenhanger Estate

Indicative BAT Assessment for Basic Energy Requirements (1)

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

- 1. The Operator should provide the energy consumption information in terms of delivered energy and also, in the case of electricity, converted to primary energy consumption.**

Table 13 Energy export and onsite consumption

Energy Generation / Export	GWh Delivered (per annum)	GWh Primary (per annum)	% of Total
Predicted energy generation as electricity	28	28	100%
Predicted energy usage as electricity to operate the facility	3	3	10.7%
Predicted energy export as electricity to Grid	25	25	89.3%

- 2. The Operator should provide the following Specific Energy Consumption (SEC) information.**

Plant average electrical consumption is 349 kWh/h (Electricity generated is 3185 kWh/h).
Average heat required by the biogas plant including heat exchanger is 814 kWh/h (Thermal energy production per hour is 3240 kWh/h)

- 3. The Operator should provide associated environmental emissions.**

There are two aspects to the emissions impact that will occur from the facility, which are polluting emissions and global warming emissions. The polluting emissions are addressed in **Section 11)** The global warming emissions resulting from CO₂ emissions are considered to have zero global warming potential as the emissions arise from a renewable energy source. This is in line with current Environment Agency guidance H2 which states that such emissions should be treated as carbon neutral.

Indicative BAT Assessment for Basic Energy Requirements (2)

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

1. Operating, maintenance and housekeeping measures should be in place.

All plant will be subject to planned preventative maintenance programme. This will ensure it is maintained to maximise operational efficiency. Examples of the maintenance arrangements are provided under in **Attachment 8**.

Monitoring and preventative maintenance will contribute to energy efficiency, by directly ensuring the plant is operating effectively, but also by maximising plant availability. Plant availability provides a dual role in maximising energy efficiency, as it both creates renewable energy but also avoids the need for consumption of non-renewable energy.

2. Basic low-cost physical techniques should be in place to avoid gross inefficiencies. These should include insulation, containment methods, (such as seals and self-closing doors), and avoidance of unnecessary discharge of heated water or air (e.g. by fitting simple control systems such as timers and sensors).

Suitable thermal insulation has been implemented during the design and construction phases of the installation.

The heat recovery system pipe work will be insulated and all cooling and heat recovery systems which use water will be closed circuit systems.

The CHP units will be housed in self-contained units.

3. Energy-efficient building services should be in place to deliver the requirements of the Building Services section of the guidance note H2 Energy efficiency for IPPC.

Plant design and energy optimisation of services in buildings will meet BAT requirements.

4. Energy management techniques should be in place, according to the requirements of Section 2.3 on page 75 noting, in particular, the need for monitoring of energy flows and targeting of areas for reductions.

Further savings in energy consumption will be made through energy management, which will be achieved through staff internal training, monitoring activities and management supervision. Monitoring activities include daily checking of CHP pressure, temperatures, spark plug and air filters, and a regular review of electricity usage.

5. An energy efficiency plan should be provided

Energy efficiency plan will be developed and implemented.

Indicative BAT Assessment for further energy efficiency requirements

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

1. **The following techniques should be implemented where they are judged to be BAT based on a cost/benefit appraisal according to the methodology provided in Appendix 4 of the Guidance Note H2 Energy efficiency for IPPC.**

Energy supply techniques

2. **The following techniques should be considered:**
 - **use of Combined Heat and Power (CHP)**
 - **generation of energy from waste**
 - **use of less polluting fuels**

The purpose of the proposed plant is to generate energy from food waste. Use of the CHPs are considered the most efficient form of electricity and heat generation from biogas; therefore alternative energy supply techniques do not require further consideration.

3. **The Operator should provide justification that the proposed or current situation represents BAT, irrespective of whether or not a CCA or DPA is in place, where there are other BAT considerations involved**

See **Section 15.1.**

4. **Where there is an on-site combustion plant other guidance is also relevant. For plants greater than 50MW, Operators should consult the IPC guidance on power generation. Operators should consult the IPC guidance on power generation (reference IPC S2 1.01 Combustion Processes: Large boilers and furnaces 50MW (th) and over and supplement IPC S3 1.01 Combustion Processes). Operators of plant of 20-50MW should consult the Local Authority Air Pollution Control guidance. On IPPC installations this guidance will be generally applicable to plant under 20MW also.**

Not applicable. Plant is below 20MW.

14.2 Use of raw materials

Indicative BAT Assessment for raw materials selection

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

1. **The Operator should maintain a list of raw materials and their properties.**

Raw materials inventory can be found **Table 10 Types and amounts of raw materials.**

2. **The Operator should have procedures for the regular review of new developments in raw materials and for the implementation of any suitable ones with an improved environmental profile.**

Procedures concerning above will be developed.

3. **The Operator should have quality-assurance procedures for controlling the impurity content of raw materials.**

The primary approach of Agrivert to quality assurance for raw materials is to purchase materials from dedicated suppliers according to pre-established material specifications, including environmental requirements. This ensures the required materials are supplied to a prescribed standard, while minimising the management time for quality assurance. However, further to this, auditing of the suppliers and materials is carried out to provide added assurance that the specified standards are maintained and therefore the environmental impact caused by the materials is minimised, i.e., the environmental requirements of the materials specification ensure the environmental impact of the materials is minimised.

4. **The Operator should complete any longer-term studies needed into the less polluting options and should make any material substitutions identified.**

Raw materials use will be regularly reviewed.

5. **The substitutions should be employed, where applicable.**

Raw materials use will be regularly reviewed.

14.3. Waste minimisation audits

Agrivert has a company-wide control philosophy to maximise efficiency, thereby minimising waste. Waste production is avoided where possible. This philosophy will be adhered to the North London AD plant by careful maintenance procedures and regular inspections.

A Waste Minimisation Audit will be carried out at least every 4 years. An appropriate methodology and improvement plan will be implemented following each audit, according to audit findings. Opportunities for improved efficiency and waste reduction will be identified through the audit process.

14.4 Waste handling, recovery and disposal

All waste will be stored and handled to secure prevention of emissions. Appropriate physical measures will be in place. All waste documentation will be maintained on site for the relevant period of time, including waste transfer notes and waste consignment notes.

Waste production will be avoided wherever possible by careful maintenance and regular inspections of the plant, and management controls. Where waste needs to be removed off site, it will be sent for recovery or where this is not technically or economically possible it will be disposed of, while avoiding or reducing the impact on the environment. Waste will only be sent to appropriately authorised facilities. Duty of Care checks will be carried out on all waste contractors.

The arrangements for waste management for the waste streams are discussed in **Table 4 Waste Impacts**.

15) EPB3: Appendix 5 – Specific questions for the hazardous and non-hazardous waste recovery and disposal sector

15.1. Indicative BAT requirements for Pre-Acceptance

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

- 1. From the waste disposal enquiry the Operator should obtain information in writing relating to:**
 - **The type of process producing the waste**
 - **The specific process from which the waste derives**
 - **The quantity of waste**
 - **Chemical analysis of the waste (individual constituents and as a minimum their percentage contributions)**
 - **The form the waste takes (solid, liquid, sludge etc.)**
 - **Hazards associated with the waste**
 - **Sample storage and preservation techniques**

Agrivert will produce (prior to waste acceptance at the site) a procedure that will ensure BAT requirements are achieved at the North London AD Facility. This procedure for our existing Wallingford AD Facility in Oxfordshire can be seen in **Attachment 10 (ii)** (Agrivert procedure “Standard Operating Procedures for Anaerobic Digestion Systems”).

- 2. Unless a sample and analysis has already been completed by a third party and the Operator has sufficient written information from them, then the Operator should in every case obtain representative sample(s) of the waste from the production process/current holder and compare it against the written description to ensure that it is consistent.**

A representative sample of the waste is obtained and compared against the written description to ensure it is consistent. This process will be detailed as in **Attachment 10 (ii)**.

- 3. Other than for pure product chemicals or laboratory smalls, the chemical analysis should relate to an actual analysis and not simply be based on product data sheets or an extrapolation of information on product data sheets. For example, taking the concentrations as specified and applying a dilution factor is not acceptable.**

Chemical analysis results will be based on actual analysis of representative samples, not product data sheets.

- 4. Wastes should not be accepted at the installation without a clear method or defined treatment and disposal route being determined in advance and costed before the waste is accepted at the installation.**

The treatment route is AD for all wastes accepted at site.

- 5. The Operator should ensure that the sample is representative of the waste and has been obtained by a person who is technically competent to undertake the sampling process.**

Agrivert will produce (prior to waste acceptance at the site) a procedure that will ensure BAT requirements are achieved at the North London AD Facility. This procedure for our existing Wallingford AD Facility in Oxfordshire can be seen in **Attachment 10(ii)** (Agrivert procedure “Standard Operating Procedures for Anaerobic Digestion Systems”).

- 6. The type of information that would demonstrate the reliability of the samples includes:**

- **Location of sampling point, for example, effluent tank**
- **Capacity of vessel sampled (for samples from drums an additional parameter would be the total number of drums)**
- **Method of sampling, e.g. sampling tap (mid flow). “top” sample**
- **Number of samples and degree of consolidation**
- **Operating conditions at time, e.g. normal operations, shut down, maintenance and/or cleaning**
- **Preservation techniques**

Agrivert will produce (prior to waste acceptance at the site) a procedure that will ensure BAT requirements are achieved at the North London AD Facility. This procedure for our existing Wallingford AD Facility in Oxfordshire can be seen in **Attachment 10 (ii)** (Agrivert procedure “Standard Operating Procedures for Anaerobic Digestion Systems”).

- 7. Samples should be clearly labelled and any hazard identified.**

Agrivert will produce (prior to waste acceptance at the site) a procedure that will ensure BAT requirements are achieved at the North London AD Facility. This procedure for our existing Wallingford AD Facility in Oxfordshire can be seen in **Attachment 10(ii)** (Agrivert procedure “Standard Operating Procedures for Anaerobic Digestion Systems”).

- 8. Sample tracking systems within the installation should be established and auditable**

No samples kept at the installation – these undergo a technical appraisal at a suitable laboratory, arranged by Agrivert’s Commercial Team (based off-site) when received from Clients.

- 9. Analysis should be carried out by a laboratory with robust quality assurance and quality control methods and record keeping**

All Testing is carried out by Sciantec Analytical Laboratory who have a robust internal quality system. At the heart of the system is accreditation by UKAS to the internationally recognised standard for competence – ISO/IEC 17025:2005. ISO 17025:2005 is the British, European and International Standard for quality assurance in analytical laboratories. In the UK,

laboratories claiming compliance with this standard are inspected and accredited by UKAS. Accreditation also means that the laboratory's management systems meet the principles of ISO 9001:2000. The full standard covers quality control procedures and method specific procedures.

Sciantec is also approved by DEFRA under the Animal By-Products Regulations 2001, by the Agriculture Industries Confederation under the Trade Assurance Scheme for Combinable Crops (TASCC) and by the GAFTA Trade Assurance Scheme.

Laboratory quality control and assurance standards are essential if data generated is to have meaning and value. Sciantec has systems and protocols in place to assure the quality of all its analytical data. Quality assurance follows the sample from receipt, throughout the analysis, to the point at which results data are reported. It also covers the laboratory's analytical and data management systems.

Sciantec also participates fully in a range of proficiency testing schemes demonstrating its on-going competence. Samples containing unknown levels of compounds are sent out three or four times a year, analysed for the specified analytes and then results returned to the PT Scheme Co-ordinator. At the annual inspection by UKAS, the laboratory's results from each PT round will be assessed for on-going competence.

If Agrivert were to use alternative laboratories, their performance, experience and accreditation would be checked prior to use and a suitable number of duplicate samples would be sent to check the accuracy and repeatability of results.

10. Analysis required will vary depending upon the nature of the waste, the process to be used and what is known about the waste already. Results of analysis should be kept within the tracking system. These details should include:

- **Check on constituents declared by waste producer/holder to ensure permit compliance, treatment plant specification and final disposal**
- **All hazardous characteristics**
- **Physical appearance**
- **Colour**
- **pH**
- **Presence, strength and description of odour assessment (note COSHH implications)**

Agrivert will produce (prior to waste acceptance at the site) a procedure that will ensure BAT requirements are achieved at the North London AD Facility. This procedure for our existing Wallingford AD Facility in Oxfordshire can be seen in **Attachment 10 (ii)** (Agrivert procedure "Standard Operating Procedures for Anaerobic Digestion Systems").

11. Further analysis may include other parameters relevant to the treatment method or waste stream e.g.:

- **Presence of oxidants**
- **Acidity and alkalinity**

- COD
- Ammonia
- Flashpoint
- Presence of sulphide
- Presence of cyanide
- List I and List II substances
- Other substances of environmental significance

Liquid wastes are tested for antibacterial properties, and pH to prevent damage to the digesters. As outlined in **Attachment 10(ii)** (Agrivert procedure “Standard Operating Procedures for Anaerobic Digestion Systems”).

12. Also, for example in the case of oil recovery

- Chlorine
- Sulphur
- Metals
- PCB's

Not relevant – no waste oil or other higher risk wastes accepted.

13. Installations accepting waste oils should have the facility to hold and test loads for PCB's or a surrogate test for chlorine at a level of detection to assess compliance with the requirements of the Waste Oils Directive.

Not relevant – no waste oil accepted.

14. Following characterisation of the waste, a technical assessment should be made of its suitability for treatment or storage to ensure Permit conditions are being met.

Agrivert will produce (prior to waste acceptance at the site) a procedure that will ensure BAT requirements are achieved at the North London AD Facility. This procedure for our existing Wallingford AD Facility in Oxfordshire can be seen in **Attachment 10(ii)** (Agrivert procedure “Standard Operating Procedures for Anaerobic Digestion Systems”).

15. There must be a clear distinction between sales and technical staff roles and responsibilities. If non-technical sales staff are involved in waste disposal enquiries, then a final technical assessment prior to approval should be made. It is this final technical checking that should be used to avoid build-up of accumulations of waste.

The North London plant will have a dedicated team of operatives to run the plant supported by Agrivert's Operations Manager and Commercial Team. The Commercial Team works to source feedstock and manage waste volumes for the plant. The operations team (plant manager and 2 operatives) will report to the Operations Manager and the Commercial Team (Director, Manager and 2 Contract Managers).

16. **All records relating to pre-acceptance should be maintained at the installation for cross-reference and verification at the waste acceptance stage. These records should be kept for a minimum of 3 years.**

Agrivert will produce (prior to waste acceptance at the site) a procedure that will ensure BAT requirements are achieved at the North London AD Facility. This procedure for our existing Wallingford AD Facility in Oxfordshire can be seen in **Attachment 10 (ii) (Agrivert procedure “Standard Operating Procedures for Anaerobic Digestion Systems”)**.

15.2 Indicative BAT requirements for Acceptance

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

Load Arrival

1. On arrival loads should:

- **Be weighed, unless alternative reliable volumetric systems to specific gravity data are available**
- **Not be accepted into site unless sufficient storage capacity exists and site is adequately manned to receive waste**
- **Have all documents checked and approved, and any discrepancies resolved before the waste is accepted**
- **Have any labelling that does not relate to the contents of the drum removed before acceptance on site.**

All vehicles are weighed in and out of the facility, with the net weight making up the recorded delivery rate. This is done automatically by the weighbridge system.

Operatives will assess that there is adequate space in the Reception Building before waste is accepted for final delivery. This check is visual and is carried out throughout the working day. Waste is only accepted if the site is adequately manned to receive waste.

Duty of Care documents are approved at the pre-acceptance stage, and held electronically (submitted to Agrivert's Commercial Team and scanned if required). The delivery is visually checked for any discrepancies before the load is accepted.

Drum labels with information not relating to the contents of the drum are removed before acceptance on site.

2. Hazardous wastes should only be received under the supervision of a suitably qualified person (HNC qualified chemist or higher)

Not relevant – no hazardous waste accepted.

Load Inspection

3. Visual inspection. Where possible, confirmatory checks should be undertaken before offloading where safety is not compromised. Inspection must in any event be carried out immediately upon offloading at the installation.

Agrivert will produce (prior to waste acceptance at the site) a procedure that will ensure BAT requirements are achieved at the North London AD Facility. This procedure for our existing Wallingford AD Facility in Oxfordshire can be seen in **Attachment 10(ii)** (Agrivert procedure "Standard Operating Procedures for Anaerobic Digestion Systems").

4. Check every container to confirm quantities against accompanying paperwork. All containers should be clearly labelled and should be equipped

with well-fitting lids, caps and valves secure and in place. Any damage, corroded or unlabelled drums should be put into a quarantine area and dealt with appropriately. Following inspection, the waste should then be unloaded into a dedicated sampling/reception area.

Containers delivered to site will normally be emptied into the waste bunker immediately on acceptance. Any stored containers will be clearly labelled with well-fitting lids, caps and valves secured in place. Drums found to be damaged, corroded or unlabelled will be put into a quarantine area and dealt with appropriately.

- 5. At this stage the waste tracking system unique reference number should be applied to each container. Each container should also be labelled with the date of arrival on-site and primary hazard code.**

Containers delivered to site will normally be emptied into the waste bunker immediately on acceptance. Any stored containers will be labelled with the reference number and date of arrival on site. No hazardous wastes are accepted.

- 6. Where containers are bulked, the earliest date of arrival of the bulked wastes should be transposed from the original container onto the bulk container.**

Not relevant – no bulking of wastes on site.

- 7. The inspection, unloading and sampling areas should be marked on a plan and have suitably sealed drainage systems (see Section 2.8 on page 89)**

The inspection, unloading and sampling areas are marked on the Reception Building Plan (**Attachment 4 (vi) –Reception Building Clean & Dirty Areas**) and have sealed drainage systems.

Sampling – Checking – Testing of Wastes - Storage

- 8. Other than pure product chemicals and laboratory smalls, no wastes should be accepted at the installation without sampling, checking and testing being carried out. Reliance solely on the written information supplied is not acceptable, and physical verification and analytical confirmation are required. All wastes, whether for on-site treatment or simply storage, must be sampled and undergo verification and compliance testing.**

Agrivert will produce (prior to waste acceptance at the site) a procedure that will ensure BAT requirements are achieved at the North London AD Facility. This procedure for our existing Wallingford AD Facility in Oxfordshire can be seen in **Attachment 10 (ii)** (Agrivert procedure “Standard Operating Procedures for Anaerobic Digestion Systems”), which provides guidance on sampling, checking and testing of wastes. This procedure is required to achieve and maintain PAS110 accreditation.

- 9. The Operator should ensure that waste delivered to the installation is accompanied by a written description of the waste describing:**

- The physical and chemical composition**
- Hazard characteristics and handling precautions**
- Compatibility issues**

- **Information specifying the original waste producer and process**

Documents will be held electronically and checked against the weighbridge key assigned to each delivery vehicle. These include a written description of the waste describing its composition and the original waste producer and process. Wastes with hazard characteristics or compatibility issues are not accepted at the site.

10. On-site verification and compliance testing should take place to confirm:

- **The identity of the waste**
- **The description of the waste**
- **Consistent with pre-acceptance information and proposed treatment method**
- **Compliance with permit**

All waste loads arriving on site have been pre-tested or audited prior to acceptance and the documents are held electronically. If waste arrives on site which is not compliant with the site permit or not in accordance with pre-acceptance information, the waste will be rejected. The contractual requirement to accept vehicles in a swift and efficient manner does not allow detailed sampling of vehicles beyond visual sampling however random sampling (especially of new customers) takes place.

11. The Operator should have clear and unambiguous criteria for the rejection of wastes, together with a written procedure for tracking and reporting such non-conformance. This should include notification to the customer/waste producer and the Regulator. Written/computerised records should form part of the waste tracking system information.

BAT is achieved with Agrivert procedures “AQD 203b New Customer Account Form” seen in **Attachment 10 (iii)** and “Standard Operating Procedures for Anaerobic Digestion Systems” (**Attachment 10(ii)**) which provide clear and unambiguous criteria for the rejection, tracking and reporting of non-conforming loads. It is not possible to prevent a partial offload of a contaminated load due to the sealed nature of the delivery vehicles, and this is commonplace in Energy from Waste plants. A small quantity is offloaded for inspection, and in the event of contamination the vehicle will not be allowed to offload at the Reception Building. The offloaded contaminated material will then be quarantined and removed from site.

12. Documentation provided by the driver, written results of the acceptance analysis, details of offloading point or off-site transfer location should be added to the tracking system documentation.

Documents will be held electronically and checked against the weighbridge key assigned to each delivery vehicle.

13. A record of the sampling regime for each load and justification for the selection of this option should be maintained at the installation

Records will be available at the installation.

14. Wastes must not be deposited within a reception area without adequate space

Operatives will assess that there is sufficient space in the Reception Building before waste is accepted for final delivery. The bunker tipping system allows up to 160m³ of waste to be tipped and this buffers natural delivery peaks and troughs. This check is visual and is carried out throughout the working day. The operatives are responsible for carrying out these checks. Excessive volumes are prevented by only accepting known tonnages, which have been established during pre-acceptance programming.

15. Wastes in containers should be unloaded into a dedicated reception area pending acceptance sampling. Such storage should be for a maximum period of 5 days. During this period there should be no bulking up or mixing of drums or decanting the contents into bulk storage. Wastes should not be stored within this reception area according to compatibility in line with HSE Guidance Note HSG71. Appropriate storage must be achieved immediately upon offloading.

Containers delivered to site will normally be emptied into the waste bunker immediately on acceptance. Any stored containers will be inspected immediately and (if accepted) stored in an appropriate area and not bulked up, mixed or decanted into bulk storage. No ABPR waste will be stored in containers outside of the Reception Building.

16. Should the inspection or analysis indicate that the wastes fail to meet the acceptance criteria (including damaged or unlabelled drums), the such loads should be stored in a dedicated quarantine area and be dealt with appropriately. Such storage should be for a maximum of five working days. Written procedures should be in place for dealing with wastes held in quarantine, together with a maximum storage volume.

Wastes that fail the acceptance criteria will be rejected. However in the event of loads failing the acceptance criteria after being offloaded, these will be quarantined. These will be stored inside and removed within 5 days, but the intention is to remove them within the same working day.

17. If the cause of the failure to meet acceptance criteria is due to incompatibility, then the wastes should be segregated immediately to remove the hazard.

No incompatible wastes will be accepted at the site, but the quarantine area of the Reception Building is available in the event of a contaminated load being delivered. By pre-testing waste prior to initial acceptance for inhibition qualities, we ensure that the biology within the AD system and the quality of the outgoing digestate is correctly maintained.

18. Tankered wastes should be sampled prior to acceptance. There should be no storage pending sampling.

Wastes will be sampled at source and sent to a laboratory for analysis.

19. The driver of the vehicle carrying the waste may arrive at the installation with a sample that has been taken at some stage beforehand. This should be the exception and only be relied on if:

- **There are health and safety and environmental control considerations, for example, water reactive substances which would make sampling difficult, and**
- **The following written information has been supplied – the physical and chemical composition, hazard characteristics, incompatible substances and handling precautions, information specifying the original waste producer and process, and**
- **The waste has been taken directly from the production site to the waste treatment installation.**

This would only be done in exceptional cases and only if BAT requirements are met.

20. The installation should have a designated sampling point or reception area. These should be in close but safe proximity to the laboratory/checking facility and the sampling point should be visible (or covered by CCTV), if sampling is not directly supervised by, for example, laboratory staff.

BAT achieved with site design.

21. The offloading, sampling point/reception and quarantine areas should have an impervious surface with self-contained drainage, to prevent any spillages entering the storage system or escaping off-site. Most spills and leaks during sampling are on a small scale, resulting from released from the back valve of a tanker if the sample is being obtained this way. Attention should be given to ensuring that incompatible substances do not come in to contact resulting from spills from sampling, for example, with a sump serving the sampling point. Absorbents should be made available.

The offloading, sampling/reception and quarantine areas are marked on the Reception Building Plan **Attachment 4 (vi)** and have an impervious surface with self-contained drainage. Spill kits are held on site to aid in clearing spills quickly.

Sampling of Bulk Liquid Wastes

22. Deliveries in bulk road tanker should be accompanied by a ‘Wash-out’ certificate or a declaration of the previous load so that contamination by this route can be checked.

Tankers are only used for foodstuffs, not other products or wastes that could cause contamination.

23. Samples are usually taken by the tanker driver from one of three points on the tanker:

- **Top Hatch**

- **Back Valve**
- **Sight Glass**

An initial litre of material is removed from the tanker via the top hatch, back valve or sight glass, visually inspected and sent away for retrospective analysis. This is done on an ad hoc basis where there is a cause for concern.

- 24. The key requirement is to obtain a sample that is representative of the load, that is, the sample takes account of the full variation and any partitioning within a bulk load such that ‘worst-case’ scenarios are accounted for. Taking a sample through a top hatch of the surface of the liquid may not be representative, but may be useful in establishing whether there may be a layer of, for example, solvent or some other immiscible substance, which may be unsuitable for treatment. Top samples should be obtained from the cross-section of the load, that is, a core sample.**

Samples are taken from the core of the load, for example top samples are obtained from the cross-section of the load taking account of the full variation and any partitioning.

- 25. A gantry should be used to avoid the need to take samples from the back valve of tankers, which is likely to result in a small spillage.**

Where possible, we will avoid having to take samples from the back valve of tankers.

Sampling Drummed Waste

- 26. The contents can only be identified with certainty if every container is sampled. Acceptance should involve sampling every container. However, analysis of composite samples is acceptable with such a sampling regime. A representative sample must be obtained by taking a core sample to the base of the container. Operators should ensure that lids, bungs and valves are replaced immediately after sampling.**

Agrivert will produce (prior to waste acceptance at the site) a procedure that will ensure BAT requirements are achieved at the North London AD Facility. This procedure for our existing Wallingford AD Facility in Oxfordshire can be seen in **Attachment 10(ii)** (Agrivert procedure “Standard Operating Procedures for Anaerobic Digestion Systems”) which provides guidance on taking representative samples.

Drum Labelling

- 27. For drummed waste, controls should ensure each drum is given a unique label to facilitate a record of:**
- **The location of each drum**
 - **The duration of storage**
 - **The chemical identity of the drums contents**
 - **The hazard classification for each drum**

Containers delivered to site will normally be emptied into the waste bunker immediately on acceptance. Any stored containers will be labelled with the reference number, date of arrival on site and the nature of the contents and their location will be recorded.

28. Drums should be handled and stored so that the label is readily visible

Containers delivered to site will normally be emptied into the waste bunker immediately on acceptance. Any stored drums will be handled and stored so that the label is readily visible.

Acceptance of Laboratory Smalls

29. The procedure for accepting laboratory smalls on-site should be essentially identical to that for drummed waste. They differ from the 'normal' waste inputs to site in that they are in a pure concentrated form.

Not relevant – no laboratory smalls accepted on site.

30. In situations where the Operator has undertaken the identification and packaging on behalf of the customer, then the on-site verification can be restricted to opening the drums to check that the containers remain undamaged. In such cases the load must be accompanied by documentation confirming the checking and packaging. In situations where the drum has been packed by the customer, then full checking and verification should be undertaken.

Not relevant – no laboratory smalls accepted on site.

Waste Rejection Procedures

31. Lab smalls must not be accepted at a facility where there is insufficient suitably qualified personnel to process these wastes within the above timescales

Not relevant – no laboratory smalls accepted on site.

32. If on opening a drum it is found that it contains incompatible substances, or that the substances have not been packed adequately, then the drum should be sorted and repacked immediately and the non-conformance procedure followed.

Not relevant – no laboratory smalls accepted on site.

33. Sorting and repackaging of laboratory smalls should take place in a dedicated area/store. Once wastes have been stored according to hazard classification, with due consideration for any potential incompatibility problems, and repacked, then these drums should not be stored within the dedicated laboratory smalls area but should be removed to the appropriate storage area.

Not relevant – no laboratory smalls accepted on site.

34. The operator should have clear and unambiguous criteria for the rejection of wastes, together with a written procedure for tracking and reporting such non-conformance. This should include notification to the customer/waste producer and the Environment Agency. Written/computerised records should form part of the waste tracking system information. The operator should also have a clear and unambiguous policy for the subsequent storage and disposal of such rejected wastes. This policy should achieve the following:

- **Identifies the hazards posed by the rejected wastes**
- **Labels rejected wastes with all information necessary to allow proper storage and segregation arrangements to be put in place**
- **Segregates and stores rejected wastes safely pending removal**

Agrivert will produce (prior to waste acceptance at the site) a procedure that will ensure BAT requirements are achieved at the North London AD Facility. This procedure for our existing Wallingford AD Facility in Oxfordshire can be seen in **Attachment 10(ii)** (Agrivert procedure “Standard Operating Procedures for Anaerobic Digestion Systems”) which provides clear and unambiguous criteria for the rejection, tracking and reporting of non-conforming loads. This procedure is required to achieve and maintain PAS110 Accreditation.

Records

35. The waste tracking system should hold all the information generated during pre-acceptance, acceptance, storage, treatment and/or removal off-site. Records should be made and kept up to date on an ongoing basis to reflect deliveries, on-site treatment and despatches. The tracking system should operate as a waste inventory/stock control system and include as a minimum:

- **Date of arrival on-site**
- **Producer details**
- **All previous holders**
- **A unique reference number**
- **Pre-acceptance and acceptance analysis results**
- **Package type and size**
- **Intended treatment/disposal route**
- **Record accurately the nature and quantity of wastes held on site, including all hazards and identification of primary hazards**
- **Where the waste is physically located in relation to a site plan**
- **Where the waste is in the designated disposal route**
- **Identification of Operators staff who have taken any decision re acceptance or rejection of waste streams and decided upon recovery/disposal options**

A transfer note is held for each load being delivered to site, showing the date of arrival on site, producer details, details of all previous holders, the unique reference number, and the type and size of any packaging. We also hold waste analysis results, and information on the nature of the wastes delivered to site.

The intended treatment/disposal route is Anaerobic Digestion for all waste accepted at the site.

The actual quantity of waste is calculated by the weighbridge system to ensure accuracy.

Waste cannot be accurately located after it enters the bunker due to the continuous flow process.

The site diary contains records of any decisions that were required regarding acceptance or rejection of waste arriving on site, including identification of the staff member taking the decision.

36. All records relating to pre-acceptance should be maintained and kept readily available at the installation for cross-referencing and verification at the waste acceptance stage. Records should be held for a minimum of two years after the waste has been treated or removed off-site. Records should be held in an area well removed from hazardous activities to ensure their accessibility during an emergency.

All records relating to pre-acceptance will be available electronically for a minimum of two years after waste treatment, and can be accessed with site computers or with personal laptops/iPads.

37. The system adopted should be capable of reporting on all of the following:

- **Total quantity of waste present on-site at any one time, in appropriate units, for example, 205 litre drum equivalents**
- **Breakdown of waste quantities being stored pending on-site treatment, classified by treatment route**
- **Breakdown of waste quantities on-site for storage only, that is, awaiting onward transfer**
- **Indication of where the waste is located on site relative to a site plan**
- **Comparison of the quantity on site against total permitted**
- **Comparison of time the waste has been on-site against permitted limited**

These records should be held in a designated area, as agreed with the Agency, well removed from hazardous activities to ensure their accessibility during any emergency.

The waste tracking system enables us to produce reports including the total quantity of waste and total quantity of each EWC code via weighbridge tickets. Reports on the quantity of material received on site are produced monthly, and monitored against the permitted maximum. All waste is in bulk and non-hazardous. There is a single treatment route, including depackaging, for all wastes received on site. No waste is stored for onward transfer. There is no permitted time limit for waste being held on site. All records are held in the site office and eventually in the head office archive.

38. Back-up copies of computer records should be maintained off-site

At the end of every office day (Monday to Friday) a designated member of staff, currently our Financial Controller, takes the backup tape from the previous night. The designated member of staff is responsible for storing each tape securely at their home until it is required again.

General

- 39. Wastes should not be accepted at the installation without a clear defined method of recovery or disposal being determined and costed and ensuring there is sufficient capacity available. These checks should be performed before the waste acceptance stage is reached.**

The treatment route is AD for all wastes accepted at the installation, and loads are scheduled in advance to ensure there is sufficient capacity available.

- 40. The Operator should ensure that the installation personnel who may be involved in the sampling, checking and analysis procedures are suitably qualified (HNC qualified chemist or higher) and adequately trained, and that the training is updated on a regular basis.**

Suitable level of training achieved and maintained through WAMITAB scheme.

- 41. Analysis should be carried out by a laboratory with suitably accredited test methods**

All laboratories used will have UKAS accreditation.

- 42. Samples should be retained on-site for a minimum of two days after the waste has been treated or removed off-site including all residues from its treatment.**

Waste streams are sampled prior to arrival at site.

- 43. Once analysis has confirmed that the waste is acceptable, the Operator should only then create a batch for treatment or a load for off-site removal. Once a batch has been assembled for treatment, the operator should create a composite sample for analysis prior to treatment. Scope of analysis depends upon intended treatment but should be specified.**

Waste streams are sampled prior to arrival at site.

- 44. There must be a clear distinction between sales and technical staff roles and responsibilities. If non-technical sales staff are involved in waste enquiries then a final technical assessment prior to approval should be made. It is this final checking that should be used to avoid build-up of accumulations of wastes and to ensure that sufficient capacity exists.**

Agrivert's Commercial Department are responsible for the management of incoming waste to the AD facility, ensuring that the AD facility has the appropriate level of waste delivered to ensure biological stability whilst maintaining process viability. The Commercial Department all have a detailed technical knowledge of the AD process and ensure that all new incoming waste sources are tested prior to being accepted at site.

All incoming waste deliveries are inspected by Agrivert's Site Operatives to ensure that the waste accords with the incoming Waste Transfer Note and Agrivert's incoming waste planner (which advises sites weekly of their incoming clients and waste types).

15.3 Indicative BAT requirements for Waste Storage

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

Offloading/discharge of waste

1. **The Operator should have in place a system to ensure that the correct discharge point or storage area is used. The options include:**
 - Ticket systems
 - Supervision by site staff and if relevant CCTV
 - Keys
 - Colour-coded points/hoses or fittings of a specific size

The waste delivery is supervised by site staff and there is internal and external CCTV to record vehicle deliveries.

2. **Offloading and quarantine points should have an impervious surface with self-contained drainage, to prevent any spillage entering the storage system or escaping off-site (see Section 2.8 on Page 89).**

The Reception Building is fully sealed and benefits from an impervious surface equipped with internal sealed drainage. All tanks are fully sealed and lined with a leak detection membrane.

3. **Damaged hoses and connections must not be used.**

Damaged hoses and connections will not be used, and daily site inspections will identify these.

4. **Only couplings of the correct size for the connection should be used and the coupling should be able to withstand the maximum shut valve pressure of the transfer pump.**

Drivers are instructed during induction to only use couplings of the correct size for the connection. A range of coupling sizes are held on site anticipating delivery vehicles arriving with incorrect couplings. The coupling is able to withstand the maximum shut valve pressure of the transfer pump.

Record Keeping

5. **The Operator should have an internal tracking system which should satisfy the objectives and minimum standards given at Section 2.1.2 on Page 25 for all wastes.**

Waste is tracked by weighbridge data backed up by waste transfer notes.

General Storage Requirements

6. **Storage areas are often the most visible aspects of the installation. Storage areas should be located away from watercourses and sensitive perimeters,**

for example, those which may be adjacent to public rights of way, housing or schools, and within the security-protected area of the installation to prevent vandalism.

All storage areas are located away from watercourses and sensitive perimeters and located either in sealed concrete tanks or, in the case of the Reception Building, within a secure building accessed by speed doors.

Security is in place during out-of-work hours, when the sites perimeter fence is fully locked.

7. Storage areas should be located to eliminate or minimise the double handling of wastes within the installation.

The storage areas are located in a manner whereby waste is only handled (managed) once during the process until its final export as digestate and waste packaging.

8. Storage areas should clearly be marked and signed with regard to the quantity and hazardous characteristics of the wastes stored therein.

The storage areas (tanks) are clearly marked and signed. Due to the continuous flow nature of the process, quantity is not recorded. The waste is not hazardous. All wastes within the storage areas are treated as ABPR wastes and signed accordingly. The quantity of waste in each storage area is controlled by level sensors which are accessed via the Control System. Waste delivered through the Reception Building will be held no longer than 72 hours before being processed.

9. The total maximum storage capacity of the site should be clearly and unambiguously stated in writing, accompanied with details of the method used to calculate the volumes held against this maximum and set out in the site plan. The stated maximum capacity of the storage areas should not be exceeded and the site plan updated to reflect any changes before they are implemented.

Maximum storage capacities are controlled by visual inspection and strict programming of deliveries, the tank capacities are monitored continually by level sensors on the Control System. In the event that levels reach the maximum capacity of the storage area in liquid tanks, the Control System will alert the operator and cease loading that tank.

10. All containers should be clearly labelled with the date of arrival, relevant hazard code(s), chemical identity and composition of the waste and a unique reference number or code enabling identification through stock control and cross-reference to pre-acceptance and acceptance records. All labelling should be resilient enough to stay attached and legible throughout the whole time of storage at the installation.

Containers delivered to site will normally be emptied into the waste bunker immediately on acceptance. Any stored containers of waste or raw material containers are labelled with the reference number, date of arrival on site, description of contents and identification of any hazardous characteristics. Containers will have labels that are resilient enough to stay attached and legible throughout their storage at the installation.

11. **Storage area drainage infrastructure should ensure that all contaminated run-off is contained, that drainage from incompatible wastes cannot come into contact with each other and the fire cannot spread between storage/treatment areas via the drainage system.**

The Reception Building storage area is fully sealed with contained drainage that recycles all run-off back into the process.

12. **Procedures must be in place for the regular inspection and maintenance of storage areas, including drums, vessels, pavements and bunds. Inspections should pay particular attention to signs of damage, deterioration and leakage. Records should be kept detailing action taken. Faults must be repaired as soon as practicable. If containment capacity or capability of bund, sump or pavement is compromised, (unless effecting a repair is more expedient and working with wastes in close proximity does not compromise safety), then waste must be immediately removed until the repair is completed.**

There are visual inspections by operatives during the working day to maintain constant vigilance over any damage or necessary maintenance. Examples of checks are included in the **Attachment 8 Management and maintenance schedule**. If containment is compromised then waste will be immediately removed until repairs are completed, unless it is safe and more expedient to carry out repairs without removing the waste.

13. **There should be daily inspection of the condition of containers and pallets and written records should be kept of these inspections. If a container is found to be damaged, leaking or in a state of deterioration, it should immediately be over-drummed or the contents transferred to another container or processed.**

Containers and pallets are stored inside the sealed Reception Building which successfully mitigates any damage. Storage areas are inspected daily and any concerns recorded.

14. **Over-drumming should be seen as an emergency measure and take place, if appropriate, in a designated location equipped with Local Exhaust Ventilation (LEV) as necessary. All appropriate information should be transferred onto the label of the new container. Large quantities of wastes in over-drums should be avoided by re-drumming once the incident leading to over-drumming has been dealt with. Pallets damaged to the extent that the stability of the containers is or may become compromised should be replaced. "Plastic shrink wrap" should only be used to provide secondary stability to drum/container storage in addition to the use of sound pallets.**

Not relevant – no over drumming used on site.

15. **There should be vehicular, for example, forklift, and pedestrian access at all times to the whole of the storage area such that the transfer of containers is not reliant on the removal of others that maybe be blocking access, other than drums in the same row. Drums should not be stored on other drums more than two high and allow access for inspection on all sides. That is, four**

x 205 litre drums on a pallet, stacked no more than two x 205 litre drums high in rows.

BAT achieved with site design. Reception Building layout enables areas of storage which do not affect the operational ability of the waste acceptance area.

16. All spillages of hazardous wastes should be logged, where spillages >200 litre then additionally the Regulator should be informed.

BAT is achieved with Agrivert Procedure QP26 "Accident and Incident Reporting and Investigation as seen in **Attachment 10 (iv)**.

17. Activities that create a clear fire risk should not be carried out within the storage area, even if it is not formally classified as hazardous. Examples including grinding, welding or brazing of metalwork, smoking, parking of normal road vehicles except while unloading, charging of the batteries of fork lift trucks.

Fire risk is minimised in the waste storage area. In the event that grinding, welding or brazing is necessary to be conducted in situ, this is controlled by a risk assessment, method statement and Permit to Work. The whole site is a non-smoking site. Normal road-going vehicles do not park in the Reception Building, and designated parking areas are clearly marked. No recharging of batteries takes place on site, however should this be required, a designated area away from all waste storage will be identified and utilised. Please see further information in **Attachment 14 Fire Prevention Plan**.

Turnover

18. Storage within the reception area should be for a maximum of five working days. Following receipt, wastes should be treated or removed off-site as soon as possible. The total storage time will depend upon the characteristics of a particular site and the waste types being stored. For example, on a site in a sensitive location handling hazardous wastes, however, may be held on-site for longer periods. However, all waste should be treated or removed off site within a maximum of six months for the date of receipt.

Wastes are processed as received in all possible circumstances to clear the majority within the day of delivery. No waste will be stored for more than two days unless in a safe palletised or containerised form within the Reception Building. These particular wastes are fed into the process as and when required due to their normally higher calorific value. All waste is processed within six months and removed off site within that period. The bunker tipping system forces a FiFo methodology preventing wastes from lingering within the reception building

19. Storage under cover for drummed waste has the advantage of reducing the amount of potentially contaminated water that may be produced in the event of any spillage and extending the useful life of the container. It is preferable that wastes are stored under cover. This should also apply to any container that is held in storage pending sampling and emptied containers. Covered areas must have adequate provision for ventilation by means of wall or roof

vents or construction of the area, for example, open barn. Any such warehousing should meet the requirements of HSG71 (see Ref 4).

Waste that is stored in the Reception Building is kept under cover and the building is appropriately ventilated.

20. Containers should be stored in such a manner that leaks and spillages could not escape over bunds/edge of the sealed drainage area.

Containers are stored within the Reception Building and any leaks and spillages will be controlled by the internal drainage system. The Reception Building is bunded and has significant falls to drain to contain any spills.

21. Containers should be stored with well-fitting lids, caps and valves, secured and in place.

Any containers on site have well-fitting lids, caps and valves that are secured in place. Any food waste containers are held in covered storage within the Reception Building, which is fully enclosed and benefits from an internal drainage system.

22. Storage areas for containers holding substances that are known to be sensitive to heat and light or reactive with water or moisture should be under cover and protected from water, heat and direct sunlight.

The Reception Building ensures that any susceptible wastes in containers are protected from heat and light, and their containers will protect them from water or moisture. All are protected from direct sunlight.

23. Storage areas for containers holding flammable or highly flammable wastes should meet the requirements of HSG51, HSG71 and HSG76 (see Ref 4).

Storage areas are not used for flammable or highly flammable wastes.

Aged Stock

24. It is important to avoid accumulations of waste, which may in turn lead to deterioration in the container resulting in spillage or, in extreme cases, the deformation of the container to such an extent that it cannot be moved.

BAT achieved with site containment design. Storage areas are inspected daily and any concerns recorded for remedial action to be taken by site management.

Segregation

25. In addition to the requirement of this document, the segregation of wastes should meet the requirements of HSG71 and be justified by risk assessment.

No hazardous wastes accepted.

26. HSG71 provides no guidance on the use of fire walls to achieve separation or segregation of different types of waste in outdoor storage. Fire walls which are impervious to liquid, at least 2m high, and capable of withstanding an intense fire on one side without collapse, can be used to reduce the 3m

separation required for some combinations of materials marked as 'keep apart'. No more than two sides of a storage area should be provided with fire walls, because it would prevent good ventilation.

Not relevant – all wastes accepted are stored indoors. Please see further information in **Attachment 14 Fire Prevention Plan**.

Storage of Aerosols

27. **Storage of aerosols should take place under cover in closed containers or cages. Aerosols should not be stored in open containers.**

Not relevant – no aerosols accepted.

Storage of Laboratory Smalls

28. **Written procedures for the segregation and packing of laboratory smalls should be produced identifying:**

- **How the hazards associated with each package are identified.**
- **How the risks of adverse reactions occurring between individual packages are assessed, and by whom.**
- **The level of competence, qualification and training required by those undertaking this assessment**
- **How incompatible substances (i.e. those that could react to generate heat, fire or hazardous reaction products) are prevented from being stored within the same drum.**
- **How wastes are to be packed and stored.**
- **How the wastes are to be recovered or disposed.**

Not relevant – no laboratory smalls accepted.

29. **Incompatible substances should not be stored within the same drum.**

Not relevant – no laboratory smalls accepted.

30. **Sorting and repacking of laboratory smalls should take place in a dedicated area/store. Once the wastes have been sorted according to hazard classification, with due consideration for any potential incompatibility problems, and repacked, then these drums should not be stored within the dedicated laboratory smalls area but should be removed to the appropriate storage area.**

Not relevant – no laboratory smalls accepted.

Compatibility Testing

31. **In order to prevent any adverse or unexpected reactions and releases before transfer involving the following activities, testing should take place prior to the transfer:**

- Tanker discharge to bulk storage
- Tank to tank transfer
- Transfer from container to bulk tank
- Bulking into drums/IBC's
- Bulking of solid waste into drums or skips

The proposed mixes of wastes and reagents are fully assessed.

- 32. Any evolved gases and cause of odour should be identified. If any adverse reaction is observed, an alternative discharge or disposal route should be found.**

In the event of an adverse reaction being observed, an alternative discharge or disposal route will be found.

Transfer from Tanker, Drums and Other Containers in Bulk Storage

- 33. Due consideration should be taken of the implications of scale-up from laboratory compatibility testing to bulk transfer and the Guidance is given in HSG143 (see Ref 4).**

The proposed mixes of wastes and reagents are fully assessed.

- 34. Wastes in containers should be transferred into storage vessels by dip pipe to minimise splash, fume and odour.**

Not relevant – no containers of waste accepted.

- 35. Transfer/discharge should only take place after compatibility testing has been completed and then only with the sanction of an appropriate manager. Approval should specify which batch/load of material is to be transferred, the receiving storage vessel, equipment required, including spillage control and recovery equipment, and any special provisions relevant to that batch/load.**

Transfers of material are approved by the site manager and carried out in accordance with Agrivert site-specific work instructions. The proposed mixes of wastes and reagents will have been fully assessed.

- 36. During bulking to tankers, vapour balance lines connected to appropriate abatement equipment should be used.**

Not relevant – no bulking into tankers.

- 37. Tankers must not be used as reaction vessels. Blending by bulking into tankers should only take place following a risk assessment and once suitable verification and compatibility testing has been carried out.**

Not relevant – no bulking into tankers.

- 38. If flammable chemicals are being transferred, particular caution has to be taken to avoid the generation of static electricity, with the subsequent risk of**

ignition. Guidance on the safe use and handling of flammable liquids is provided by the Health and Safety Executive and is contained within HSG140, including Guidance on the issue of static electricity build up. There may be other regulatory requirements to consider such as the Dangerous Substances and Explosive Atmospheres Regulations.

Not relevant – no storage of flammable chemicals

39. A representative sample of the receiving tank/vessel/container should be mixed in a proportional ratio with a sample of incoming waste stream that it is proposed to add to the tank/vessel/container. The two samples should take account of the “worst-case” scenario of likely constituents. The particular test parameters will be driven by the wastes being bulked. As a minimum, records of testing should be kept including any reaction giving rise to:

- Increase in temperature
- Viscosity of change
- Separation or precipitation of solids
- Evolution of gases
- Evolution of odours

Not relevant - no incompatible substances are accepted on site.

Bulking up into drums (including drum, tank, tanker or small container transfers into drums)

40. Bulking/mixing should only take place under instruction from and under direct supervision of a suitable manager/chemist and should be under Local Exhaust Ventilation (LEV) in appropriate cases. Odorous materials should not be bulked up. If bulking different batches then a composite sample must be compatibility tested prior to bulking. Containers should be kept lidded/sealed as much as possible.

Not relevant – no bulking up into drums.

41. HSG140 advises that gravity dispensing is avoided, unless physical protective devices are provided to prevent loss of the whole tanker contents.

Not relevant – no bulking up into drums.

42. Where tankers are discharged into drums, it must be possible to close the valve at the tanker end quickly and safely in case of spillage. The valve at the dispensing end must close automatically if it is released. A minimum of two people will be needed for this operation or the operation of the tanker valve is access to the tanker valve is difficult.

Not relevant – no bulking up into drums.

Bulking of Solid Waste

43. Bulking of different batches must not take place without compatibility testing. In appropriate cases, LEV should be used to control odour and dust. Drums

should be manipulated using mechanical means, for example, forklift with rotating drum handling fitting. Liquid waste must not be added to solid wastes other than in 'purpose-designed and built' reaction vessel, that is, decanting of liquids into a skip containing bulked solids must not take place.

BAT achieved with site design. No incompatible substances are accepted on site.

Bulk Storage Vessels

44. **Bulk storage vessels should be located on an impervious surface that is resistant to material being stored, with sealed construction joints within a bunded area with a capacity at least 110% of the largest vessel or 25% of the total tankage volume, whichever is greater.**

The storage areas are bunded. A full description is given in **Section 12) EPB3: Question 3 – Operating Techniques.**

45. **Vessels supporting structures, pipes, hoses and connections should be resistant to the substances (and mix of substances) being stored. There should be a routine programmed inspection of tanks, mixing and reaction vessels including periodic thickness testing. In the event of damage or significant deterioration being detected, the contents should be transferred to appropriate storage. These inspections should preferably be carried out by independent expert staff, and written records should be maintained of the inspection and any remedial action taken.**

Vessels, supporting structures, pipes, hoses and connections are resistant to the substances (and mix of substances) being stored. These are subject to visual inspections by operatives during the working day to maintain constant vigilance over any damage or necessary maintenance.

46. **Vessels should not be used beyond the specified design life or used in a manner or for substances that they were not designed. Vessels should be inspected at regular intervals, with written records kept to prove that they remain fit for purpose. See HSE Guidance Note PM75.**

All vessels are constructed from cast in situ reinforced concrete to provide a design life far beyond the life of the plant. Vessels are subject to visual inspections by operatives during the working day to maintain constant vigilance over any damage or necessary maintenance.

47. **As a general rule, no open-topped tanks, vessels or pits should be used for storage or treatment of hazardous or liquid wastes. Exceptions would require justification in the permit application.**

No open-topped tanks, vessels or pits used for hazardous or liquid wastes.

48. **No uncontrolled venting to atmosphere should be allowed, and all vents should be linked to suitable scrubbing and abatement systems. Vapour balance lines should be connected to suitable abatement systems.**

There is no uncontrolled venting to atmosphere. Air from within the Reception Building is treated through an active water scrubber before being passed through a suitably sized biofilter.

- 49. Tank and vessel optimum design should be considered in each case, taking into account waste type, storage time, overall tank design and mixing system to prevent sludge accumulation and to ease desludging. Storage and treatment vessels should be regularly desludged.**

All tanks and vessels are designed to handle the waste they contain and the storage time they are used for. The mixing tank is designed to accumulate grit, and has access for grit removal by specialist confined space entry crews. De-sludging (removal of grit) takes place at least once every six months.

- 50. Tank and vessels should be equipped with suitable abatement systems and level meters with both audible and visual high-level alarms. These systems should be sufficiently robust and regularly maintained to prevent foaming and sludge build up affecting the reliability of the gauges.**

Digesters and storage tank are equipped with pressure release valves. Level meters are installed within the tanks to monitor waste levels and provide early warning of any leaks within the tanks. There is a membrane around all relevant tanks for leak detection and liquid containment should any structure fail. All level sensors can be cleaned to prevent sludge build-up. Point source air extraction removes air from within tanks and vessels towards treatment within an active scrubber and biofilter. Foaming within the tanks is controlled by effective process control including low organic loading rates and effective stirring.

- 51. Storage vessels holding flammable or highly flammable wastes should meet the requirements of HSG51, HSG140, HSG716 and HSG176 (See Ref 4).**

No storage vessels hold flammable or highly flammable wastes.

- 52. All connections between vessels must be capable of being closed via suitable valves. Overflow pipes should be directed to a contained drainage system, which may be the relevant bunded area, or to other vessels provided suitable control measures are in place.**

All connections between vessels can be closed either automatically via pneumatic valves or via manual valves. In the event of an overflow of a storage tank in the Reception Building, the liquid is contained within the bunded area in the Reception Building.

- 53. Underground or partially underground vessels without secondary containment should be scheduled for replacement with above-ground structures, for example, double skinned vessels with leak detection.**

All underground or partially underground vessels have secondary containment in the form of a leak detection membrane.

- 54. Plant and equipment taken out of use should be decontaminated and removed.**

Plant and equipment taken out of use will be decontaminated and removed or appropriately stored.

- 55. Pipework should preferably be routed above ground; if below ground it should be contained within suitable inspection channels.**

Underground gravity drains will be of PVC-U to the following standards;

BS EF1401-1:1998 - Plastic piping systems for non-pressure underground drainage and sewerage - PVC-U.

Gravity drains will be pressure tested prior to commissioning and thereafter re-tested on a bi-annual basis to ensure no leakage to groundwater.

- 56. Silos should be equipped with dust abatement systems, level monitors and high-level alarms.**

Not relevant – no silos on site.

- 57. Storage bunkers should have extraction systems for particulate abatement or spray damping.**

Not relevant – no storage bunkers on site.

Tank and Process Piping Labelling

- 58. All vessels should be clearly signed as to their contents and capacity and should have a unique identifier. Tanks should be appropriately labelled.**

Each tank is allocated a name/number, capacity and can be monitored on the electronic Control System.

- 59. Labelling should differentiate between wastewater and raw processed water, combustible liquid and combustible vapour and direction of flow.**

Tanks and process pipework are clearly marked with direction of flow and any associated combustion or explosion hazards. There is no distinction between wastewater and process water – all liquids are re-used within the process.

- 60. Written records of all tanks should be kept detailing:**

- **Unique identifier**
- **Capacity**
- **Constriction including materials**
- **Maintenance schedules and inspection results**
- **Fittings (including joints and gaskets etc.)**
- **Waste types that may be stored/treated in the vessel including flashpoint limit.**

Written records of all tanks are kept. These records include unique identifiers, capacity, construction and materials, maintenance schedules, results of inspections, fittings and the

waste types that may be stored or treated in the vessel including any relevant hazard information (such as flashpoints).

- 61. A suitable pipework coding system should be used, for example, RAL European standard colour coding.**

All pipework is suitably coded.

- 62. All valves should be tagged with a unique identifier shown of the process and instrumentation diagram. All connections should be correctly sized and maintained in an undamaged state.**

All valves are tagged with a unique identifying number which reflects the number on the control system screen. All connections are correctly sized and must be maintained in an undamaged state to enable them to be used.

Other storage requirements

- 63. Waste or raw materials in non-waterproof packaging should be kept under cover.**

All wastes and all raw materials in non-waterproof packaging are kept under cover.

Container Movement

- 64. Drums and other mobile containers should only be moved between different locations (or loaded for removal off-site) in accordance with written procedures. The waste tracking system should then be amended to record these changes.**

Not relevant – no containers accepted.

15.4 Indicative BAT requirements for Waste Treatment

BAT Requirements extracted from Sector Guidance Note IPPC S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste).

General Principles

- 1. Provide adequate process descriptions of the activities and the abatement and control equipment for all of the activities such that the Regulator can understand the process in sufficient detail to assess the operator's proposals and in particular to be able to assess opportunities for further improvements. This should include:**
- **Diagrams of the main plant items where they have environmental relevance, for example, storage, tanks, treatment and abatement plant design etc.**
 - **Details of chemical reactions and their reaction kinetics/energy balance**
 - **Equipment inventory, detailing plant type and design parameters, for example, flashpoints**
 - **Waste types to be subject to the process**

- **Control system philosophy and how the control system incorporates environmental monitoring information**
- **Process flow diagrams (schematics)**
- **Venting and emergency relief provisions**
- **Summary of operating and maintenance procedures**
- **A description of how protection is provided during abnormal operating conditions such as, runaway reactions, unexpected releases, start-up, momentary stoppages and shut-down for as long as is necessary to ensure compliance with release limits in permits**
- **Additionally, for some applications, it may be appropriate to supply process instrumentation diagrams for systems containing potentially polluting substances**

A description of the AD process is provided in **the Section 8)** The main environmental controls are listed in the Environmental Risks Assessment (**Section 9**). The waste types are listed in the **Section 10**).

2. Provide an assessment of the efficiency of the treatment process in relation Schedule 5 (of the PPC Regulations) pollutants in terms of the removal or partition of substances within the process, for example:

- **The precipitation of metals from solution for removal in the filter cake**
- **The degree of transfer between the incoming waste and the emissions (to air, solid waste to land and liquid effluent to sewer of, for example, pesticides or solvents)**

The quantity of incoming waste, and the quantities and types of the emissions resulting from treatment of the waste, are detailed in **Section 10)** and **Section 11**).

3. The Operator should analyse these parameters using the following steps:

- **Process mapping – identify the pathways within the process for the specific substance or substances**
- **Mass Balance**
- **Action Plan – if the study indicates that losses from a process are contributing to:**
 - **The breach of an Environmental Quality Standard**
 - **The breach of benchmark**
 - **A significant environmental impact**

Our technology provider has completed full process mapping and a site-specific study of mass balance.

4. Then an action plan should be prepared and implemented

Following assessment it is not foreseeable that losses from the process will contribute to the breach of an Environmental Quality Standard or benchmark, or to a significant environmental impact.

- 5. For each treatment process, the objectives and reaction chemistry should be clearly defined. There must be a defined end-point to the process so that the reaction can be monitored and controlled. The suitable inputs to the process must be defined, and the design must take into account the likely variables expected within the waste stream.**

The proposed treatment process and the likely variables within the waste stream have been clearly defined.

- 6. For each new reaction, proposed mixes of wastes and reagents should be assessed prior to the treatment in a scale laboratory test mix of the wastes being to a predetermined batch 'recipe'. It should also take into account the potential scale-up effects, for example, increased heat of reaction with increased reaction mass relative to the reactor volume, increase residence time within the reactor and modified reaction properties. See HSG143 for further Guidance.**

The proposed mixes of wastes and reagents have been fully assessed.

- 7. The reactor vessel and plant should be specifically designed, commissioned and operated to be fit for purpose. Such designs should include consideration of chemical process hazards and a hazard assessment of the chemical reactions, prevention and protective measures together with consideration of process management i.e. working instructions, staff training, plant maintenance, checks, audits and emergency procedures.**

BAT achieved with site design. BAT was followed with site design for controlling dust on site. The process management is carried out in accordance with Agrivert company-wide and site-specific work instructions.

- 8. In order to track and control the process of change, there should be a written procedure for proposal, consideration and approval of changes to technical developments, procedural or quality changes.**

BAT achieved with Agrivert procedure QP02 "Control of Documents and Records" as seen in Attachment 10 (v).

- 9. All treatment/reaction vessels should be enclosed and should be vented to atmosphere via an appropriate scrubbing and abatement system (subject to explosion relief).**

The Reception Building is enclosed and the air vented to atmosphere is first treated via the scrubber and biofilter. All AD tanks are enclosed. In the rare event that some venting of biogas to atmosphere is unavoidable, this will take place via the flare stack, and records kept.

- 10. Where appropriate, reactor vessels (or mixing vessels where the treatment is carried out) should be charged with pre-mixed wastes and reagents. For example, reactor vessels should be 'pre-limed' or charged first with the**

reacting alkali to control the reaction using, for example, calcium hydroxide solution made up prior to charging the reactor vessel. The decanting of sacks or drums to the vessel should be avoided. Failure to charge the vessel can lead to:

- Concentration 'hot spots' at the surface of the reaction liquor
- Loss of reaction control
- Emissions of fume from the instantaneous reaction at the interface
- The open hatch venting any fume and by-passing appropriate abatement

BAT achieved with site design. The monitoring of site processes is carried out in accordance with site-specific work instructions.

11. **The reaction should be monitored to ensure that the reaction is under control and proceeding towards the anticipated result. For this purpose, vessels used for treatment should be equipped appropriately e.g. High-level, pH and temperature monitors. These should be automatic and continuous and linked to a clear display in the control room or laboratory together with an audible alarm. Risk assessment may require process monitors to be linked to cut-off devices.**

BAT achieved with site design. The monitoring of site processes is carried out in accordance with site-specific work instructions.

Specific Substances

Volatile Organic Compounds (VOC)

12. **Chemical process waters will contain VOC's (another specific example is contaminated groundwater), resulting in a high COD which may mean that the waste is unsuitable for direct discharge to sewer. Techniques such as drying are not an option and attention should focus on displacement methods of treating.**

AD offers a completely sealed liquid management system. All incoming wastes are immediately captured in the reception tanks and bunkers. Following reception the whole process is totally enclosed and no liquids (except wastewater from welfare facilities and excess rainwater discharged to an existing package sewage treatment plant) leave the plant other than the treated digestate destined as liquid fertiliser, which is collected and transported in sealed tankers.

13. **For example, the waste stream could be treated by air stripping counter-current flow across a packed column. Stripped VOC in air flow can be removed by carbon absorption or similar technique. For other techniques to control VOC emissions, see Section 2.2.4 on page 69.**

Not relevant

Cyanides

14. It is important that the pH of the system remains greater than 10. If the pH is too low, then cyanogen chloride and hydrogen chloride can be formed. Hence caustic is generally added in excess to prevent the pH from falling too low. The reaction is very rapid and the resulting cyanate cannot readily be reduced back to cyanide. Any discharge of cyanate to a water course will not enable free cyanide to be generated.

Not relevant – no cyanide is accepted on site.

15. Since the treatment of cyanide is by oxidation, the destruction can be checked by the measurement of redox potential (electropotentials). Addition of sodium hypochlorite to an effluent sump can therefore be controlled. If there is an excess hypochlorite present, the chlorine gas can be released; and if there is a lack of hypochlorite, then residual cyanide is present. Discharge of aqueous effluent to watercourses should therefore be monitored continuously for cyanide content, free chlorine and pH.

Not relevant – no cyanide is accepted on site.

Chromium (IV) Compounds

16. Chromium (IV) is the highest oxidation state of the metal. An example of it is chromic acid or chromium oxide (CrO_3) which is acidic, toxic, water-soluble and an oxidising agent. Treatment by straightforward neutralisation would be ineffective and the initial step is the reduction to Chromium (III) to the trivalent state. The conversion of Cr^{6+} to less hazardous Cr^{3+} can be achieved by the addition of a reducing agent, for example, sodium metabisulphite or waste pickling acid, which is rich in ferrous iron. The trivalent metal can then be precipitated in the normal way.

Not relevant – no chromium is accepted on site.

Strong Acids

17. For concentrated acids (70% w/w) there is a market for blended or re-concentrated acids. It has become viable to use 50% (w/w) acids, although this requires a greater energy input. It is anticipated that the growth area for this market may be seen as a preferred option for some acid wastes, but is dependent on the volume and contamination of the waste.

Not relevant – no concentrated acid is accepted on site.

Phenolic Solutions

18. A process has been developed treating aqueous wastes containing phenol (3-5% w/w) by catalytic oxidation, using an oxidising agent and a metal catalyst, on a 3 tonne batch basis in a stainless-steel, double skinned vessel. The treatment procedure must take account of the exothermic nature of the reaction. Feedstock can be diluted before treatment. The process temperature, pH and redox potential are continually monitored.

Not relevant – no phenol is accepted on site.

Attachment 1 – Pre Application

Attachment 2 – WAMITAB Certificates

Attachment 3 – Environmental Management System



Attachment 4 – Site Plans

- i. Location Plan
- ii. Site Plan
- iii. Permit boundary, Point Source and Emissions Plan
- iv. Site Layout Surface Areas
- v. Process Flow Layout
- vi. Reception Building Clean & Dirty Areas
- vii. Site Location Plan with 1000m radius

Attachment 5 – Site Condition Report

- i. Site Condition Report
- ii. Ground Investigation
- iii. Phase 1 Habitat Survey

Attachment 6 – Non-Technical Summary

Attachment 7 - Environmental Risk Assessment Reports

- iv. Ecology Report
- v. Air Quality Assessment
- vi. Odour Assessment
- vii. Noise Impact Assessment

Attachment 8 - Management and maintenance schedule

Attachment 9 - Odour Management Plan

- i. Odour Management Plan
- ii. Design Parameters for Air Extraction
- iii. Odour Management for Failures

Attachment 10 - BAT Analysis Information

- i. Noise Mitigation and Monitoring
- ii. Standard Operating Procedures for AD Systems
- iii. AQD 203b New Customer Account Form
- iv. QP26 Accident & Incident Reporting & Investigation
- v. QP02 Control of Documents & Records

Attachment 11 - Other Information

- i. Conder CNS B Bypass Separator Range
- ii. Klargester BioDisc BE-BL Package Sewage Treatment Plant



Attachment 12 - OPRA Spreadsheet

Attachment 13 – Permit Application Checklist



Attachment 14 – Fire Prevention Plan