Response ID ANON-WNRX-3VU9-6

Submitted to **Appropriate measures for the biological treatment of waste**
Submitted on **2020-08-20 20:39:30**

Introduction

1 Please tell us if you are responding as an individual or on behalf of an organisation or group. Please select one answer only from the following options:

Responding on behalf of an organisation or group

If you're responding on behalf of an organisation or group, please tell us who you are responding on behalf of.:
The REA - The Association for Renewable Energy and Clean Technology.

If you selected other, please specify:

2 Keeping up to date The Environment Agency would like to keep you informed about the biological treatment of waste guidance. If you would like to receive updates about the guidance, please give us your email address below. By providing us with your email address you consent for us to email you with updates about the biological treatment of waste guidance. We will keep your details until the project is closed or until you withdraw your consent. You can withdraw your consent to receive these emails at any time by contacting us at wastetreatment@environment-agency.gov.uk . We will not share your details with any other third party without your explicit consent unless required to by law.

Please enter email address:
jenny@r-e-a.net

3 Can we publish your response? We will not publish any personal information or parts of your response that will reveal your identity.

Yes

If you do not want us to publish your response, please tell us why:

Clarifying which sites need to follow the guidance

4 Is the guidance clear about which sites have to follow the guidance?

No

Please provide further information to explain your answer:
The guidance is clear about what operations and types of treatment will be required to follow the guidance. However, questions and concerns have been raised by members about when it will apply, consistency, the costs of complying with the requirements and the EA resources to deal with assessing compliance. We support the risk based approach where size, operations, location and impacts are taken into account when assessing what measures are appropriate.

For existing operational sites where improvements are necessary, including large structural changes, like covering the reception bays, covering open windrows, more fencing, covering lagoons etc. all or most changes will need structural engineer reports and may require a planning application. The timeframe for this will take a lot longer than Aug 2022. In addition, existing sites will also have to try and operate whilst improvements are made. Existing sites should have longer to comply with the requirements as long as they can actively show that they are going through the motions of making the improvements. We urge the EA to consider allowing sites to work towards site improvements over a 5 to 10 year period or introducing a clear phased approach for sites to comply with.

The cost of making the required improvements is also a concern and will affect the speed in which changes can be made. Large capital equipment like covering a reception bay, windrow turner, covering windrows could run into thousands and be unaffordable to small sites. It will be difficult to pass on the cost to existing contracts, where gate fees are fixed for a set period and there is no change to increase gate fee income to help fund the changes. As contracts are renewed, the cost of improvements can be factored in, but this takes time. We urge the EA to carry out a Business Engagement Assessment to assess the total cost to industry of compliance with the requirements.

It is imperative that the measures are applied consistently across the industry, but it is very important that this is proportionate to the risk posed by the activity. Several of our members operating small scale composting sites are particularly concerned about the requirements and feel there is a real risk that implementing them will force the site to close as they cannot afford to do so in the timeframe. This potentially penalises those small-scale operators and may not be proportionate to the risk posed. It may also result in waste being transported longer distances with all the associated environmental impact of this and encourage illegal operations to deal with the waste. The small sites are also concerned about the cost of demonstrating to the EA why some of the suggested measures are not appropriate for their site.

Timing of the introduction of the requirements must be consistent across the industry to ensure that there is a level playing field and not unfair commercial advantages where one site must comply, whilst another facility (who may be competing for the same feedstock) does not, and therefore will have cheaper operational costs. By subjecting some sites to new requirement and others not, creates an economic disadvantage to the sites who are required to comply. It is essential that the requirements are introduced and implemented at the same time across the industry, regardless of the type of permit a facility has.

Concerns have also been raised about the resources within the EA for assessing and agreeing appropriate measures with sites. We are already aware there is a

backlog in the permitting system, with pre-application advice currently suspended. One member also reported that when asked to submit a Fire Prevention Plan and Odour Management Plan the EA took 3 years to respond to their draft plans they submitted. If the appropriate measures are to be implemented fairly, then the EA needs to be properly resourced to process queries and have discussions with operators. It would be good to understand more about how national and local EA will oversee and implement the requirements. Members have also raised concerns about the interpretation on the ground of the risk based approach by regulatory officers compared to the intentions by the policy team. The risk based approach needs to be pushed downstream to officers on ground.

A member has commented that is not clear if when carrying out a BAT Assessment for an AD site whether only the BAT AELs from the Waste Treatment BAT Conclusions document need to be assessed or the relevant parts of the whole document (as is currently required)? It would appear that all of the relevant BAT requirements are covered in the new Appropriate Measures document but it would be good to get some clarification on this.

Environmental Management system

5 Are there any additional measures that you think we should include in the environmental management system section to protect people and the environment for the biological treatment of waste sector?

No

Please provide further information to explain your answer. :

6 Are there any measures included in the environmental management system section that you feel are not relevant to the biological treatment of waste sector?

Yes

Please provide further information to explain your answer. :
Members have raised questions and concerns about some of the EMS requirements. We have listed these below in relation to the paragraph number in the document.

Para 2 - With regards to an inventory, a sensible frequency needs to be agreed with the EA for monitoring, recording and evaluating the need for corrective actions or change to management procedures re waste water and gas substances. This may be beyond what small scale; simple composting process can afford.

Para 2 – The requirement to have and maintain a site condition report was not a requirement for early sites at permit application stage and therefore many do not have one in place. It is unclear how this could be done retrospectively and this requirement should apply to new sites only. Further clarity is needed.

The requirement to have a Leak detection and Repair Plan has been questioned by a member who points out that the emissions and pollution inventory, Odour Management Plan and the provision of information on preventative maintenance will provide enough information on emissions and the control of them especially where the site has a bespoke permit and operates under IED. We appreciate this requirement is qualified by ‘where required’ but suggest this could also say ‘where not covered elsewhere in the EMS’ or similar.

Retro-fitting secondary containment potentially creates a risk of pollution. A suitable monitoring programme would address any concerns for existing facilities.

Para 28 - The first sentence ought to include ‘suitable containers’, e.g. skips with flexible covers for containing removed physical contaminants.

Para 33 – This needs clarification as it reads that some lagoons do not need covering but later in the document it suggests they do need covering. Clarity is needed on this. If covers are required for open top lagoons or even an exchange system for above ground tank with leak alarms then more time than Aug 2022 is needed due to the costs involved.

Para 38 - Ambiguous wording, does the EA mean all of those measures? Taken literally, it means you must do two or more things on this list. We suggest that this is changed to say ‘facilities must use one or a combination of the following measures’. For small scale composting sites, security guards are neither practical nor justified.

Para 39 - This needs clarity; small sites include fire prevention procedures within the EMS. EA accept this in some areas but within this paragraph it makes it compulsory to have a separate document.

Para 41 – The requirement for regular monitoring of temperature of waste in treatment, storage and oversize and screened material is open to interpretation as to what regular means. Monitoring during processing is defined elsewhere and we suggest that weekly monitoring of waste in storage, oversize and screened material would be sufficient.

The need for adequate space between windrows will be covered in an agreed fire prevention plan so the inclusion here feels like duplication.

Para 45 - For small scale sites working to 500 tonnes in the process at any one time this will be not be achievable. Similarly it may not be appropriate for AD sites. The requirement for containment and storage of firefighting water needs to be risk based to the size of the operation.

Para 54 – CO_2 should be monitored in addition to CO etc. CO is toxic but generally not present on a waste treatment site (unless incineration).

Para 56 – Sites reporting potential pollution incidents and breakdowns etc could result in a large volume of notifications without any actual incidents occurring. The requirement for sites to record these and make available on request should be sufficient. Further clarity would be helpful.

Plant commissioning, validation and decommissioning - commissioning and validation

7 Do you think that the measures in the guidance are appropriate for the commissioning of biological treatment plants?

No

Please provide further information to explain your answer. If you selected no, please propose what measures should be added or removed and why.:
Many of the requirements are appropriate but we have comments on some of the details.

Para 69 – We have had mixed feedback on the suitability of lithium tracer tests. We know this is standard in the water industry and it is supported by some members but not by others. It has been highlighted that testing is needed over at least two or three residence times at absolute constant feed rates to build an accurate picture of the mixing / dead-space and any short-circuiting characteristics of the digester.

Para 70 – The QP is likely to be revised in the next 12 months. Change last sentence to: 'Digestate certified compliant with the January 2014 edition of the AD QP is not allowed to be used for seeding anaerobic digestion plants. If and when available, check what is permitted in the latest edition of the AD QP.'

Para 71 - States that digester inoculum should be 'sourced to match the type of feedstock the facility is designed to process'. Obviously, that would be preferable, but making this a requirement could be problematic. One member reports that the project they are working on (that injected a small amount of gas in January 2020) is designed to use primarily potatoes as its feedstock. They are not aware of other biogas plants that use that feed balance – there were certainly none nearby when they were sourcing the material. Would that project be obliged to use seeding material from a potato-dominated digester? If an exception could be made, does it require active approval in advance by EA or is this just something the operator could justify after the fact if needed? What is the environmental risk in any case of using different seeding material that is otherwise within the permit?

Contingency plans, procedures and measures

8 Do you think that having and implementing a contingency plan that meets the requirements of the proposed guidance should be an appropriate measure?

Yes

Please explain your answer. If you selected no, please propose alternative measures that would make sure wastes are managed safely and securely, and achieve an equivalent level of protection for people and the environment. :
Yes but we have further comments:

Para 57 - Gas to grid entry constraints often (not always) occur at short notice, so it is unclear how a plan to reduce feeding rates will deal with any problems that result (beyond stopping making it worse). There needs to be a balance between this and keeping the digester operational. Stopping feeding can also result in a short-term increase in the amount of gas produced (the bugs response to stress) so defeating the objective.

Stopping accepting waste is likely to cause major issues for sites as many have contracts in place to accept waste. In reality, when landbank is limited, it is more likely that the site will seek alternative storage arrangements.

Waste pre-acceptance and characterisation

9 Do you think that obtaining details about who the waste producer is should be an appropriate measure?

No

Please explain your answer. If you selected no, please identify why this detail is not required.:
In many cases the requirements are appropriate but we have some specific comments:

Para 10 – We are not familiar with the square root of (n+1) rule. If the customer has a number of containers holding the same waste, sample a number of containers that is larger than or equal to the square root of the sum of the total number of containers plus one? This needs clarification.

Para 13 – We have had feedback from a member that they do not use TOC and CV to characterise substrate for their AD-plants, but use COD (for liquid substrates only) instead of TOC and biomethane potential instead of CV. TOC is difficult to measure and is insignificant. Wood residues in substrate or lignin-rich fractions have a high TOC but cannot be converted to biogas. The carbon content of substrate can be calculated from biogas potential. The biogas potential gives an accurate measurement of the bioavailable carbon in the waste (1 mol of dry biogas = 22.414 NL = 12 gC). The CV of a wood and lignin rich fraction is high, but biomethane potential is zero. When measuring biomethane potential, additional information about kinetics are gained. 1 t of starch and 1 t of cellulose have the same stoichiometry and the same CV but behave differently in a digester because starch degrades much faster and could release more biogas than cellulose.

Para 21 – The acceptance of waste should be on a risk based approach. The last sentence of this paragraph could be interpreted to limiting the acceptance of waste only in adequately covered or air contained and abated areas, which defeats the point of the risk assessment. Suggest adding 'or where the risk assessment shows that the potential for odour emissions is minimised'.

Para 40 & 41 - This needs clarity. Landscape gardeners rarely pre-book waste and in many cases members report that it is not practical to pre-book loads. Incoming waste from landscape gardeners tends to be among the cleanest feedstock to arrive at site, the material is usually very fresh (often same day) and the loads are very simple to inspect and accept or reject on the spot. This material is usually cleaner than local authority green waste. Making it difficult for landscape gardeners to drop off loads will increase the likelihood of flytipping, burning and illegal waste disposal and is not proportional to the risk posed.

Classing landscapers waste as "emergency" waste will close many small compost sites that rely on that revenue and good clean tonnage to survive through the winter months when kerbside collections stop. We suggest that having a good waste acceptance criteria and loads from landscapers that meets the acceptance

criteria should be allowed to be accepted regardless of pre-booking and would suggest removing this clause altogether. It is too open to interpretation with words like ‘occasional’ and ‘infrequent’ and it is not proportionate to the risk posed.

We asked a question of members during our webinar - Do landscapers usually book?
Answers: Usually booked - 8%, occasionally booked - 8%, booking unlikely - 46%, booking problematic - 38%.

Para 45 – Computerised waste tracking is over the top for some small-scale sites. Accurate, genuine, legible, retrievable records should be sufficient.

Para 49 – This needs clarity that the requirement for air-lock doors is for new sites only. If retro fitting is required, several sites already built may struggle for space to do this and would add significant cost and not be proportionate. Air-lock doors requirement for all new reception areas for ABP will also add considerable cost to buildings and won’t be consistent with existing sites. The requirement for a suitably engineered air extraction and ventilation system should ensure that emissions are minimised without being overly prescriptive on the details.

Para 53 – This needs to be restricted to where applicable. Open windrow composting has no scope for fitting a dust filter.

Para 54 – Clarity is needed on what covers are acceptable. We have a member who currently uses agriculture derived fibre digestate as cover over manures and chicken litter and would like to continue to do so.

We asked a question of members during the webinar about how many currently store poultry litter under cover.
Answers: Yes - 22%, No but able to - 56%, No and problematic - 22%.

Para 56 - You must have impermeable surfacing and a contained drainage system in reception areas. For many small-scale composting sites it is written into their permits that hardstanding surface is acceptable. If impermeable surfacing and contained drainage is required, many sites will stop composting. One consultant member has already surrendered three sites in last two years due to the costs not making them viable which has resulted in waste being transported many more miles to the next available site. This requirement must be applicable to the type of permit in place.

Para 57 – Limiting the storage time before treatment should also be risk based, on the type of waste, odour potential, location of site etc. Suggest removal of the 5 day limit.

Para 64 – Further work needs to be done upstream with local authorities in terms of the level of contamination in kerbside and HWRC green waste and kerbside food waste. It is possible (although costly) to remove most but not all contamination is visible when tipped.

The current wording does not define certified compostable and it does not explicitly allow non-packaging compostable items such as paper straws, tea bags, food bin / kitchen caddie liners and sacks for garden waste.

Suggesting the following changes:

Add cross-references to definitions of and guidance on what items are packaging.

Define non-packaging items in the context of this guidance. We suggest they are those which:
• hold biodegradable food or drink, materials or waste but which are not packaging because they are integral to using the product (e.g. tea bags),
• are used when consuming food or drink (e.g. straws, single-use tableware), or
• are used for holding biodegradable waste (e.g. kitchen caddy and food bin liners and garden waste sacks).

State the acceptable standards for compostable packaging and non-packaging items and require that conformance is assessed and certified by an independent certification body and that any such item has a valid certificate (lapsed certificates should not be acceptable). Independent certification is important because stating just ‘certification’ can be interpreted as self-certification and we do not support the latter due to past experience with fraudulent, misleading and unsubstantiated claims of conformance to a relevant standard.

We suggest:
‘Industrially compostable packaging and non-packaging items are allowed to be accepted where they are independently certified compliant with at least ONE of the following: EN 13432, EN 14995 or ASTM D6400.

Home compostable packaging and non-packaging items are allowed to be accepted where they are independently certified compliant with at least ONE of the following: EN 17427, AS 5810-2010, NF T51-800 or TUV Austria’s certification requirements for home compostable packaging under their ‘OK compost HOME’ scheme.

{For information not proposed for inclusion in the guidance - Further information about home compostable standards and schemes:

European Standard ‘EN 17427, Packaging — Requirements and test scheme for carrier bags suitable for treatment in well-managed home composting installations’. EN 17427 is currently being drafted by CEN (the European Committee for Standardisation) and is coded prEN 17227. The ‘pr’ part of the code will be removed when this standard is finalised and published. After it has been published, we expect that independent certification bodies will expand their services to offer assessment and certification of conformance with this standard.

The Australian Standard AS 5810-2010, ‘Biodegradable plastics — Biodegradable plastics suitable for home composting’ and the French Standard ‘NF T51- 800, Plastics — Specifications for plastics suitable for home composting’ are covered by independent certification bodies that include DIN CERTCO (in Germany) and Renewable Energy Assurance Ltd in the UK.

TUV Austria’s certification requirements for home compostable packaging under their ‘OK compost HOME’ scheme. See

https://www.tuv-at.be/green-marks/certifications/ok-compost-seedling/ for more info. Their scheme uses a well defined criteria set, many parts of which are the same as in EN 13432 and with adjusted-to-home-composting temperatures and maximum timescales for disintegration and biodegradation testing and achieving minimum disintegration and biodegradation criteria. UK and other European producers of home compostable packaging and non-packaging items have been applying for and maintaining certification through this well established and respected scheme for years.}

We also suggest the changing paragraph 64 so it reads as follows: 'If packaging and non-packaging items such as paper, card and plastic are destined for treatment alongside their contents, such items must be treatable within the conditions of the process. You must take measures to remove packaging and non-packaging items that are not independently certified industrially and/or home compostable before and during treatment to minimise the contamination of outputs.'

Para 65 – 'You must only accept separated loads of plastic packaging if it is all certified compostable to EN13432…'. What is the meaning of "all" in this sentence? If a load of compostable packaging arrives with 3 kit kat wrappers in it, does that make the operator non-compliant if they accept it?

We have suggested above how to define packaging and non-packaging items suitable to accept for biodegradation. We also suggest paragraph 65 is changed to read as follows:

'You must only accept separated loads of plastic packaging and non-packaging items, for example from closed loop sources such as festivals, coffee shops or individual buildings, if the packaging is independently certified industrially and/or home compostable (as defined above in paragraphs (insert relevant para numbers here) and the load is in compliance with your acceptance criteria.'

Para 67 - What is the definition of manual handling – any kind of litter picking by hand or removal of large tree stump? Concern that minimising the manual handling of waste will increase the amount of non-conforming material being processed and reduce the potential for contamination to be removed at the start of the process, which is common on many composting sites.

Para 80 – This needs clarity as the word 'practicable' is open to interpretation. Could also include a reference to complying with the waste acceptance criteria.

Would be good to get clarity on the expectation of "as far as practicable" for kerbside food waste AD. For kerbside food waste, contamination is often removed as part of the treatment process.

Para 93 - Why must it be 'a computerized tracking system' to hold up to date information about the available capacity of the waste quarantine, reception, general and bulk storage areas of your facility? We suggest that accurate records held electronically will be adequate.

Para 96 – It is often difficult to tell precisely how much material is in treatment phase due to losses in the process, e.g. during composting. A standard calculation could be used to give a best estimate.

Secondary containment for wastes in storage and treatment

10 Do you think that the requirement to install secondary containment that is built to a recognised standard should be an appropriate measure?

Yes

Please explain your answer:
Yes although small scale sites should be exempt from the requirements.

Waste storage, segregation and handling

11 Do you think the guidance is clear on the requirements to cover different storage structures?

No

Please explain your answer. If no, please explain why not and provide additional or alternative suggestions.:
We have comments on specific requirements below:

Para 6 - Signs for storage areas and the type of waste is acceptable but the requirement to have quantity on a sign will be difficult or impossible to keep up to date. The only time this could be useful is if it was hazardous waste or waste that's contaminated and ready to be removed from site but even then, in most cases the weight is only known when weighed at the disposal point going out of the site. Sites routinely have contamination bins but generally they don't know the amount until its weighed and ready for disposal. We suggest removing the requirement for signs to indicate quantity.

Para 9 - You must cover all existing and new storage structures, for example lagoons, tanks and outdoor bays. Further clarity is needed on the requirements particularly with regards to when covers are needed on 'outdoor bays' e.g. digestate fibre bunkers and what the expectation is re retrospective fitting. What is meant by 'dirty water'?

We have had feedback from members about it being problematic to retrospectively cover their lagoon. In one example it has been in use for 20 years and never caused an issue with smell or any other concerns. There should be some accommodation of the risk and past performance of the lagoon. Leachate lagoons from open windrow composting processes are not generally odourous and requiring a cover is not an appropriate measure.

We do not agree with the blanket requirement for covering of existing outdoor bays used for the storage of waste. This would have a massive advert impact on many outdoor windrow composting sites, and we have not seen any rationale for this requirement. It is not clear as to whether open tanks in a building will need

to be covered.

We suggest that the requirement for covers should be based on the site's odour management assessment as the type and amount of material being stored, method of storage and locations is relevant.

We asked a question of members in our webinar about are their stores currently covered?
Answers: Yes - 10%, No and could be problematic - 60%, No but working towards it - 30%.

Para 12 - Many lagoons are remotely located in the middle of the landbank where the digestate is to be spread. They have no access to power and may be unmanned, so gas collection and treatment cannot be done. Suggest restricting this so that it applies only to lagoons on or adjacent to the AD plant producing the digestate. If the capture of gas emissions was to be required, it would effectively prevent the continued use of existing farm stores.

The Clean Air Strategy will require covers for stores and the type of covers is still to be consulted on. We want to ensure there is not conflicting requirements between different guidance and legislation documents to minimise confusion. Is it worth adding in a reference here to the CoGAP for ammonia emissions?

A risk- based approach can be used for agricultural waste. Does the last point include digestate derived from agricultural waste and energy crop for example? Also for PAS110 certified digestate most of the methane has been removed in the process. If clay balls can be used retrospectively why can't they be used for 'new lagoons? Floating covers are good at reducing ammonia emissions.

It may only be nuance but the expectation on covered storage is phrased differently on p11 (similar at p31, p70) and page 37. The latter also suggests there is a distinction being made between what will be accepted for pre-existing plant because it would be too expensive/dangerous to do and what will be required for new sites. Further support for this interpretation is on page 42, para 57. There needs to be consistency throughout the document. The requirements also need to be communicated to colleagues at BEIS in respect of the implications for Green Gas Support Scheme design.

Para 13 – A member has questioned why CIRIA 759 is not referred to with respect to lagoon construction.

Para 16 – Surely the total storage capacity available to a site is the important thing, rather than each lagoon requiring to have enough capacity for 6 months storage? Further clarity needed here. It is unclear on how sufficient storage capacity is to be determined – whether you have contractual rights over the use of that capacity and/or a reasonable assessment of the risks shows it will be available at times of constraint.

Storage for 6 months for an open windrow composting site is not appropriate as typically sites manage their lagoons throughout the year ensuring there is a freeboard within the lagoons. Run-off is usually reused on site or tankered off for treatment. They don't usually spread the run-off on land. A requirement for 6 months storage would mean larger lagoons required and is not justifiable from an environmental perspective.

Para 29 – This is not possible for many open windrow composting facilities with a single drainage system.

Para 68 – Cleaning out delivery tankers for digestate. If the AD is a non-waste process, does this still apply for tankers bringing in slurry or removing liquid digestate?

We asked a question during our webinar if members clean out tankers used to transport digestate before refilling them?
Answers: Yes - 33%, No but can - 22%, No and not able to - 44%.

Acceptance and assessment of bespoke wastes

12 Do you think the requirements are clear and helpful for an operator to determine if a bespoke waste is suitable for treatment using a biological process?

No

Please explain your answer. If no, please explain why not and provide additional or alternative suggestions.:
Specific comments below:

Para 24 - Given the definition of mineralisation, fully mineralised biodegradable waste will be way, way beyond stabilised. This wording does not allow any organic matter to remain nor any slow-release nutrients that become available to plants when the organic matter gradually biodegrades, or any microbes (it's not possible to guarantee the absence of pathogenic ones and why exclude beneficial ones?). The para under the bullets is similar to how mineralisation is defined in compostable packaging standards, which is okay in that context but not this broader one.
The para under the bullet points is potentially acceptable for assessing compostable packaging & non-packaging items (e.g. compostable tableware) but it is not appropriate for all other wastes, such as forestry waste which would have significant lignin & hemi-cellulose content and where the stabilised compost would contain organic matter (within which lignin and hemi-cellulose is counted).
The default for composted bespoke waste in this guidance should be the minimum stability required in PAS 100, tested according to the methodology specified in that PAS. At least 90 % biodegradation of packaging and non-packaging items in composting and 'AD with composting' systems is specified in the standards we have recommended these items must be certified compliant with, so it is not necessary to also require 90 % biodegradation in paragraph 24.
Full mineralisation is impossible to achieve with finite retention times. The speed of conversion slows down when biodegradable substrate concentration depletes. Mineralisation refers to the advanced stage of decomposition of the organic matter into available nutrients, H_2O, CO_2, and bacterial biomass. Later the paper refers to >90% biodegradation (6.36). What is the difference between mineralisation and biodegradation? The intention of this paragraph is clear. It has to make sure that the waste has been converted as much as possible, but the wording is not clear and will lead to discussions in day to day operations.
Para 29 - You must make sure testing is carried out by labs who are UKAS or MCERT - We would better if the requirement could be for a low frequency of obligatory tests e.g. once a year in an accredited lab as more than this will be costly for the sector.

Para 36 – Similar to the above point, depending on the definition, 90 % biodegradability could be very hard to achieve. At least 90 % biodegradation of packaging and non-packaging items in composting and 'AD with composting' systems is specified in the standards we have recommended these items must be certified compliant with, so it is not necessary to also require 90 % biodegradation in this paragraph. The dry matter conversion of a good maize silage can reach 90% but most wastes have a lower specific gas yield and convert only 30%-60% of the dry matter into biogas, e.g. Cellulose: C6O5H10 Straw theoretical gas yield 830 Nm^3/t, best gas yield measured in batch test 740 Nm^3/t – did it pass the test? The default for composted or digestate waste in this guidance should be the minimum stability required in PAS 100 or PAS110, tested according to the methodology specified in that PAS.

We would advise that a better level for AD in terms of biomethane production is at least 80% of the methane potential measured in batch test (e.g. VD14630). As above 90% may be difficult to achieve depending on the variability of the waste and variations in site operation.

13 Do you think that the parameters and inhibitory values provided in the section called inhibition values for aerobic and anaerobic processes are appropriate and relevant?

No

Please explain your answer. If no, or additional substances and inhibitory values should be included please provide suggestions and reasoning for inclusion.:
Table A - This table is of limited value as it does not clearly advise the reader. Apart from informing a 'novice' of KPIs without specific guidance it is of little use.

Table B - This refers to pH optimal range of 6-8 whereas p52, para 48 refers to the optimal range for pH to 5.5 to 8. The table also refers to optimal moisture content as 50% to 70% whereas p52, para 48 refers to moisture content at 60% to 70% at the start of the process and 30% to 65% during the process. Has the moisture content in the table been confused with the optimal temperature range?

Table C – The figures in this table are contradictory to the upper limits in PAS100 and could give rise to confusion.

Table D - Again, as above, debatable information and does not offer any advantage to the EA or to the reader in general. NH4-inhibition 1.7-14 g/L, why not 0-1000 g/L? Better to include a list of possible trace gasses in biogas or from waste which can be used to specify odour abatement and gas cleaning.

Use of flares (anaerobic digestion plants only)

14 Do you think the requirement to install an enclosed flare that is capable of achieving 1,000°C with 0.3 seconds retention time at this temperature should be an appropriate measure?

Yes

Please explain your answer. If no, please explain why not and provide additional or alternative suggestions.:
We asked members during the webinar if their flares meet the requirements?
Answers: Yes - 66.6%, no but planning to upgrade - 22.2%, no - 11.1%.

For the majority of our members, the requirements are not problematic. It is important to note that sites will only flare when absolutely needed as the gas is too valuable and the economic impact of flaring is significant.

The only additional comment was about para 128 - Normally, a flare does not run on or require a jet stream.

Other comments

15 We really value your feedback on the proposed guidance. Please let us know if there are any other sections that are unclear. Let us know how we can improve them. Please provide as much information as possible to support your answer. ------Thank you,Non-Hazardous Waste Treatment Team, Environment & Business

Any other views?:
Composting and Anaerobic digestion are key technologies for addressing the climate crisis. They are truly circular economy technologies and are the best environmental options for treating organic material. AD produces renewable energy (heat, power and gas) and biofertiliser and compost produces soil improvers, both can be returned to the soil, improving soil quality, providing beneficial plant nutrients, reducing the reliance on non-renewable fertilisers and play an important role in sustainable food production. There are multiple carbon benefits from composting and AD, including the reduction of methane from organic wastes that could otherwise end up in landfill, replacement of fossil based natural gas and increasing soil organic carbon. It is useful to remember the context of organics recycling and the associated benefits.

Our members are generally supportive of risk based measures to improve operations and operate in a way without causing any environmental harm. The concerns we set out in our response are mostly related to clarity, consistency, cost of implementing the measures along with some detailed concerns about some of the technical requirements.

Clarity
We think this document would be very difficult for most people to follow. All the plans that must be developed, all the references to requirements in similar - but not identical - terms that may or may not overlap. It is not always clear whether a list means:
1. The following is a non-exhaustive list of things you could do to address the issue
2. You must do at least one of the things on this list
3. You must do two or more things on this list
4. You must do all the things on this list

Section 4 is confusing and not totally in line with other requirements. If it is intended as an overview section, this needs to be made clearer.

We have had a member request that Definitions for the document as a whole are introduced e.g. Dry AD system.

Business Engagement Assessment
There are lots of measures in the document which sites will incur costs to implement and will have a significant impact on business. Estimates from members have put the costs of implementing the requirements at between £5-10 per tonne of material processed. We've also had an estimate from a member that the storage requirements alone could cost industry £50m as a conservative estimate. In light of this, and in line with the Accountability for Regulator Impact Guidance (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/224155/bis-13-1040-accountability-for-regulator-impact-guidance.pdf) a Business Engagement Assessment must be carried out to demonstrate that the cost to industry of the proposals has been calculated.

Legal basis for change
It is not clear if either the change in requirements in this guidance, or the change in permit conditions will trigger a legal basis for change, i.e. enable operators to revisit existing contracts where their conditions conflict with the new requirements. Further clarity is needed. As an example, there are many sites with existing contracts in place with feedstock suppliers (many Local Authorities) that have a defined percentage of contamination allowed. Should the EA introduce a contamination limit in permits, it is essential that is classed as a change in law so that sites are able to revisit their contracts otherwise the face the option of breaching their permit or breaching their contract. We urge the EA to consider the cconsequences of the changes, particularly a new contamination threshold on currently held contracts.

A well written contract should have a QCIL (qualifying change in law) clause to enable contracts to be amended in line with changes in law. Unfortunately well written contracts for biowaste are quite rare given their relatively low value, especially for spot market short term contracts, less so for DBO/DBFO. As a result we can foresee many existing contracts requiring action with any change to contamination thresholds for acceptance.

The QCIL route should allow a change to be accommodated depending upon the specifics of how the clause is written. A likely outcome would be that the contract specification would be overridden by the legal requirements under the Permit. Where QCIL is not written into the contract then another contractual clause route would be through a review mechanism which could enable the specification to be altered in line with any change to the Permit contamination threshold. Depending on the specifics of the contract and how the OJEU notice was written, this could be challenged as it could be deemed that such a change was fundamental to the original award decision and the market solution/price offered by bidding parties. Re-procurement could be forced. Where neither of the above are available as mechanisms to accommodate such change in the contract, then the contract will go to dispute and likely termination for re-procurement.

It is a complex issue but it is very important that the way changes are introduced enables operators to have the legal basis to revisit contracts to fulfil the ambitions of spreading the responsibility for quality across the supply chain.

Covers
The document is confusing on what is acceptable re-covers and containment of wastes, see examples below:
• Can have 'a simple organic barrier' –p11, para 8.
• 'you can only accept 'high -nitrogen and odorous materials' using 'special handling and storage arrangements such as adequately covered, or air controlled and abated areas. p27, para 21.
• 'if you accept and store ammonia rich feedstock e.g. poultry litter and manures you can use 'a sheet, organic media…. or additional measures' p 31, para 54.
• 'you must store wastes including odorous and ammonia rich wastes in a contained environment – for solid/semi solid wastes this would be a building fitted with an appropriately engineered extraction and ventilation system……etc. p37, para 15 but then (p38) it states ' you can use a risk based approach when designing air containment for the storage of agricultural wastes.

Covering of windrows or storage bays in many cases is impractical. Trying to cover a windrow after moving is time consuming and could introduce Health and Safety issues. If the windrow is covered it's less likely to be monitored and managed appropriately. Covering windrows has the potential to inhibit air-flow, create anaerobic conditions and increase the change of release of fugitive emissions when removed. Covers for windrows should only be advised if site has sensitive receptors, emissions issues or an odour problem – i.e. risk based on individual site circumstances.

It must be made clearer in the opening sections of this document that the appropriate cover solution is driven by risk assessment/ odour assessment which includes information such as location, receptors and current operation. It should be the appropriate solution based on risk/ case by case.

It also needs to be clearer as to whether there is a need for gas abatement for new digestate lagoons where digestate is agriculturally derived. It is important distinction is made in the requirements between materials with high readily available nitrogen, and materials with low readily available nitrogen but also in relation to the total nitrogen concentration.

Contamination
We note there is no reference to a standard limit for contamination in incoming waste loads. We assume this will sit in the permits but are very concerned that the absence from this guidance could mean that limits will be applied at varying levels across the industry. It is essential that there is a level playing field for all operators.

We feel it is imperative that work is done across the whole supply chain to improve the quality of materials for organics recycling. Local Authorities need to be engaged with this process and understand their responsibilities. The responsibility for producing quality outputs sits with the operators, but more needs to be done to improve the quality of materials delivered to sites to ensure the contamination is not there in the first place.

We understand that the EA is working on a road map for reducing plastic in feedstocks for organics recycling over time which we hope will address some of the above points. We look forward to seeing this and working with the EA and industry to drive improvements. At present, we are not clear how the limits will be made mandatory, if this will be in standard rules and bespoke permits and will the limits be the same? Please refer to our point about legal basis for change. It is essential that the limits from the road map are brought into this guidance to ensure consistency and visibility.

There should be a standard set for the quality of feedstocks as this would give operators a level to address litter and non compostable items with suppliers (mainly Local Authorities). It would enable the targets to get pushed up the chain, put more responsibility on waste suppliers, enable the cost of waste analysis to be passed back to the waste suppliers and ultimately make producing quality products cheaper and easier for operators. We would like this to be a phased approach to improvements to enable the work done across the supply chain to take effect but this needs to be applied consistently across the industry. A member has suggested there should be a requirement for quarterly input analyses in the first year or until such point consistency well below the maximum level is achieved. There needs to be a robust waste assessment system to assess contamination.

Further comments on Waste treatment
Para 13 – It is unclear if more than one monitoring station is needed. Is there a minimum number of stations based on a site area calculation that the EA are expecting site to have? We suggest that in most cases one would be sufficient. Calibration should be as per the manufacturers recommendations, and at least annually.

Para 15 - You must provide impermeable surfacing with contained drainage for all areas where waste is to be treated. As per point above (p31 para 56) small scale sites can work on hardstanding. Needs to be applicable to the type of permit in place. In addition, for some open windrow composting sites, they operate with a single drainage system and segregating rainwater and run-off is not possible or practical.

Para 16 – The need for early warning signals is not relevant to open windrow composting. It needs more clarity, especially on applicability. Or the second sentence could be deleted.

Para 21 – This seems to suggest that HACCP and HAZOP have similar functions as risk assessments. HAZOP is much more process based. A HACCP would not replace the need for a HAZOP. A HACCP would only be required for the purposes of Animal by-product compliance and /or PAS100 or PAS110 compliance.

Para 27 – We have had a lot of comments from members regarding the issues with thermal imaging. Members report that thermal imaging does not accurately reflect mixing and can be skewed by sunlight on tanks and tank insulation (even with removable insulation strips). It would only provide a snapshot picture of what happens closest to the tank walls and not throughout the digester.

Condition monitoring should also be an acceptable method of monitoring to confirm that the mixing system is working effectively. A member has suggested that periodic lithium tracing every 5 years, alongside condition monitoring is an effective way of monitoring the mixing system.

Para 32 - What about open tanks in a reception building? Closed tanks can accumulate gases and are to be handled with care. The applicability for sealing should be restricted to outdoor tanks.

Para 37 – The inclusion of hand sorting is a contradiction to the previous requirement for minimal manual handling. Asking to remove contaminants from the feedstock as far as reasonably practicable is open to interpretation. Does ‘reasonably practicable’ mean the same as ‘reasonably possible’ in the sentence that comes after (in relation to contaminants other than non-compostable plastic). Further clarity is needed here. We refer back to our comments on contamination.

Para 48 - The particle size range is far too narrow and may be hard to achieve for some biodegradable waste types (e.g. woody particles) until the near the end of the process. Particle size is critical for ensuring the structure and porosity of the composting material is correct and it also influences the stackability of dewatered fibre digestate. The range needs a larger size to accommodate woody materials which are important for air circulation within windrows, aerated static piles and contained batches that one or more undergo aerobic treatment phases. The lower range needs to include material below 10 mm too as grass clippings and some sub-fractions within food wastes will be below this size and will be present in the feedstock.

The BREF recommends avoiding an early refining step to reduce the particle size too far, which would hinder the diffusion of air through the material.

We prefer the particle size restriction is removed and replaced with a requirement for the operator to decide, document and ensure compliance with one or more particle size range sets for prepared biodegradable wastes that are appropriate to the biodegradable waste types treated. Our second preference, relevant if the EA decides to continue specifying a ‘one size fits all’ particle size range, is to change it to
0-500 mm for the longest particle dimension.

The specified ranges for moisture content during composting are ok. The BREF recommends a moisture content of ‘below 60-65% at the start of the process’. It doesn’t state a minimum at the start of the process. PAS100 recommends 51% moisture during the sanitization phase for effective pathogen eradication (appendix A, PAS100:2018). As a compromise, we suggest that the moisture content at the start of the process is 51-65%.

Para 51 – The requirement for daily monitoring should be restricted to every working day, not requiring monitoring during days that staff are not present on site. Daily monitoring during stabilisation is beyond the requirements in PAS100 and for many sites is excessive and unless a windrow is turned or irrigated the temperatures will not alter significantly during stabilisation. We suggest the frequency of monitoring during stabilisation should be based on a risk assessed approach.

Para 53 – Members have highlighted issues around using a 2m prove in that it would be impractical, require considerable physical effort to push into a pile and to manoeuvre around the site. The Compost Manager System probe is 1.42m and they have considerable data to demonstrate that it can effectively monitor temperature and provide representative results for large windrows. We feel the last sentence would be better to be removed.

Para 54 – Does this mean that temperature probes should be cleaned between each batch? This is probably ok for static probes, but for hand held probes used daily on multiple batches this is very onerous with no benefit. Sites typically start monitoring at the most mature / stable material and work toward the younger material in sanitisation to minimise the impact of any contamination. Suggest change to requiring regular or cleaning every working day when in use for hand held probes and for static ones, cleaned between batches.

Para 57 – One of our members is very concerned as they operate two sites with a turned continuous block open windrow composting system. They already take appropriate measures and have an environmental management system, emergency procedures and Fire Prevention Plans in place to ensure that there is an adequate reduction of risk. Changing to an open windrow system would require more space and significant investment and planning. Again, we would encourage a risk based approach and the operators to be able to demonstrate why their system and processes effectively controls the risk. The concern is that a blunt statement about not considered to be compliant may rule this option out.

Para 63 – The importance of turning windrows it to ensure they are aerated and the material on the surface is mixed into the centre of the pile and subject to the hotter core temperatures. This can be done effectively by experienced operators using loading shovels. The important thing is turning to ensure windrows remain aerobic so the 'purpose-made' requirement should be removed and the technique listed as turning.

Para 71 – The document states a proposed change to the EWC code for leachate (to 16 10 02) which is contradictory to that in the Standard Rules permit for landspreading (19 05 99). Is there clarification on whether these will be aligned to enable the continued recovery of this material, i.e. amending SR2010No4 to include 16 10 02. It is critical that these documents are aligned.

Para 72 - For PAS 100 sites after screening the compost is assessed and confirmed if it meets the PAS parameters and deemed a product. This will include meeting the stability and growth tests through regular analysis according to the frequency requirements in the PAS. This paragraph should be amended to non-PAS 100 treatment sites need to demonstrate the compost is stable.

Para 81 - The temperature optimum for AD is wide and keeping the temperature within ±2 °C does not provide additional safety. An operator would define the optimal temperature to between 38 and 48 °C. It will vary with the seasons. Suggest removal of reference to keeping temperature within ±2 °C of an arbitrary setpoint.

Para 83 - This is perhaps overly prescriptive. Many operators do not have an interlock between gas pressure and reactor feeding and will for example reduce mixing and / or CHP or gas upgrade load as a first step if gas pressure gets too high. When the pressure in a system increases it is already too late, the gas dome level (amount of biogas stored on the AD-plant) is a better indicator. The operators should be aware of what the minimal and maximal levels are and stop the feeding before and not when the amount of biogas stored on site reaches its maximum. The detailed requirements for process monitoring, alarms and interlocking should be informed by risk assessment such as HAZOP.

Para 86 - The biology will not necessarily be damaged if the digesters are not fed regularly but fluctuations can be detrimental to performance. Stopping feeding is an accepted method to remove a surplus of VFA from the digester if the digester has a biological problem and VFAs are present in high concentrations. The main message should be that the best performance will be where there is continuous feeding with as little fluctuation in feeding as possible.

Para 98 - Gas-sensors are prone to errors and can measure too high or too low O2 concentrations. A closed loop controller would have to rely on this measurement. An open loop controller which doses O2 as a percentage of total biogas flow is much more robust and does not have to rely on an O2 measurement. It is very difficult to add enough O2 into a biogas reactor to reach an explosive atmosphere (also the upper explosive limit is relevant here, not the LEL). Biogas with 55% Ch4, 45% CO2 has to be diluted down to 12% CH3 with O2 or air before it can combust, which means the required amount of air is three times the amount of biogas and that would require a huge dosing system. The real danger of dosing air or O2 into biogas is to make sure that O2 does not accumulate, e.g. dosing O2 into a tank which does not produce biogas. The CH4, O2-sensor is often not where the O2 is added but further downstream.

Para 100 – This should state 'uncontrolled' exothermic reactions. There is nothing wrong with a controlled exothermic reaction. The ingress of air into an activated carbon bed which has been purged with N2 cannot be prevented. But activated carbon filters can be made from metal or plastic. The latter are more endangered by an exothermic reaction. AC-filters should be designed to handle the risk of an exothermic reaction. This would be safer than declaring the risk non-existent by forbidding it.

Para 102 - When determining gas storage capacity, the humidity of the gas must be considered. A surprising large amount of biogas is water vapour, especially in dark gas domes which are subjected to direct sun light.

Para 104 – The options here are not helpful in terms of clarity and some members feel that a backup generator should be a requirement.

Para 111 – This should refer to the requirements for leak detection and repair and be consistent (p71-72). A member has suggested that leaks should be able to be detected from existing monitoring systems as what you put in and you got out (esp the upgrading) these parameters are already subject to monitoring so you should be able to calculate if there is a leak.

Para 119 - Pressure is not a reliable signal for biogas in a storage tank. E.g. the pressure in a gas dome will spike when the dome is filled because more air flows through the pressure control valve of the gas dome. When the gas dome level is constant, the pressure does not correlate to the level. Every biogas plant with more than one gas storage vessel should have an active gas management system, that actively distributes the gas amongst the gas storage vessels, e.g. ensures that the level in every gas dome is the same. That makes sure that there is no sudden release of biogas through a vent when a gas consumer drops out and one gas dome suddenly fills.

Para 120 - It should not be possible for an operator to valve off a PVRV, even when there is a method statement for closing the valve. Risk should be mitigated first before they are managed with method statements.

The paper should address the different qualities of PVRV in the market. We have had feedback from a member that they consider hydrostatic PVRV not fit for purpose on a waste AD-plant because they can freeze, do not have a constant opening pressure and require a relative high vacuum to open. A method statement is not a sufficient replacement for a high quality PVRV. Mechanical PVRV must not be inspected daily (there is nothing to see from the outside) and the operator must not go into an atex-zone. The need for a daily inspection needs to be changed, access for this frequency of testing is not practical or necessary.

Para 122 – We asked members during our webinar if their existing systems have the ability to record PRV release events?
Answers: Yes and we do - 37.5%, System not able to do so - 62.5%.

The requirement for data logging on SCADA will be problematic for many operators.

Para 136 – Further clarity is needed if the 10 tonne includes air humidity? At which temperature and pressure should the density be taken?

Para 144 - The requirements for a separator to be enclosed or in a building should be risk based. For example an on-farm AD site not accepting poultry litter and remote from any receptors, it could be argued that this measure would be too prescriptive. For existing sites with ‘open’ separation and bunkers for fibre this needs to be a case by case assessment as to whether a building is needed using the odour management plan/ odour assessments, risk assessment and the operating experience to date.

Para 145 – A member has asked if the requirement for covering also applies to agricultural digestate fibre? They currently use dewatered digestate to cover their clamps rather than plastic sheets so it would seem strange to have to then cover the digestate. We agree with requirement to minimise emissions but the need for covered storage or in a building should be based on a risk assessment. We suggest the second sentence is removed as it is overly prescriptive.

Emissions control

Para 3 – This should not be applicable to open windrow composting systems.

Para 6 - The guidance states the use of dispersion modelling to demonstrate no impact on receptors yet this contradicts with the blanket 1000ou specified within the BAT conclusions on channelled emissions. We welcome the use of the risk based dispersion modelling approach as derogation from the BAT conclusion.