

# PAS110 Steering Group Minutes

<b>Meeting name</b>	PAS 110 Steering Group meeting [1]	<b>Location</b>	BSI, 389 Chiswick High Road, London. W4 4AL
			Room 513
<b>Meeting date</b>	Monday 13 <sup>th</sup> May 2013	<b>Time</b>	10.00 - 16.00
		<b>Reference</b>	PAS 110

## Present:

Richard Parsons - Defra - Chairman	RPa
Clive Humphreys - EA end of waste (biowaste) lead	CH
Mike Orr – ADOWG (AD Operators' Working Group)	MO
Jacob Rindegren – ESA (Environmental Services Association)	JR
David Collins- Biofertiliser Certification Scheme	DC
Emily Nichols - Organics Recycling Group	EN
Roderick Palfrey – WRc – Technical Author for this review	
Peter Prior – AnDigestion – present at the request of REA	PP
Sean Stevenson – NRM laboratories	SS
David Tompkins – WRAP (Waste & Resources Action Programme)	DT
Matt Hindle – ADBA (Anaerobic Digestion and Biogas Association)	MH
Bhavisha Patel – BSi PAS110 project manager	
Tina Benfield – CIWM (Chartered Institute of Wastes Management)	TB
Adrian Jones - Welsh Government	AJ
Viv Dennis - EA biowaste treatment lead	VD
David Tozer – WRAP – BSi PAS110 project manager	DTz
Nina Sweet – WRAP	NS

## Apologies

Gary Stoddart – SFQC (Scottish Farm Quality Certification)	GS
Russell Mulliner – BBA (British Biogas Association)	RM
David Clark - Red Tractor Assurance	DCI
Fiona McDonald – SEPA (Scottish Environment Protection Agency)	FM
Liz Smyth – NIEA (Northern Ireland Environment Agency)	LS

		ACTIONS
1	<b>Welcome and introductions – Chair</b>	
	All attendees briefly introduced themselves.	
2	<b>Agreement of terms of reference</b>	
	The Steering Group agreed its terms of reference as previously issued by BSi.	
3	<b>Process and timetable – Chair</b>	
	<p>NS – NS explained the Process for the steering group. Timetable/chart attached. It is important that the process is inclusive and gathers as many opinions from stakeholders as possible. Trade body representatives must be in a position to represent the views of their membership at steering groups</p> <p>If this works RP (Technical author) redrafts PAS110, please see the attached timetable.</p> <p>Peter Prior enquired if anyone was representing the NFU, or country landowners? The WRAP team will brief NFU / CLA and highlight opportunities for them to provide feedback into the review process</p> <p>Clive Humphreys (EA) noted that the AD quality protocol was not part of this review process.</p>	
ACTION	<b>Brief NFU, CLA and other farming representatives (such as NFUS) to ensure that they are aware of the review process and opportunities to engage as interest parties (but not members of the steering group)</b>	WRAP

4	<p><b>Inclusion of aerobic digestates</b></p> <ul style="list-style-type: none"> <li>• Should aerobic digestates be included in PAS110?           <ul style="list-style-type: none"> <li>○ Consultation feedback – DST</li> <li>○ Discussion – All</li> </ul> </li> </ul>	
	<p>DT showed summary slide from consultation comments, from which there was no common agreement.</p> <p>DC – aerobic digestion cannot easily be included. How many? Is there relevance? Can it be accommodated?</p> <p>EN – companies want to demonstrate that their product meets End of Waste (EoW) requirements. They could undertake necessary testing to help demonstrate this. Aerobic digestion is not within the stated scope of PAS 110:2010 .</p> <p>VD - a quality protocol has been proposed for aerobic digestion – it is not something the EA is able to develop at the moment.</p> <p>PP - what is purpose of PAS110? Stability or process tool?</p> <p>MO - tricky to include another process in PAS110</p> <p>DT – could aerobic digestion community make submission to EoW panel for their own position for aerobic digestates?</p> <p>MO – There are a number of aerobic digestion operators who have some problems in waiting for a suitable standard. Although the inclusion of Aerobic Digestates in PAS 110 would add complication and could delay the review.</p> <p>AJ – park the issue because too complicated?</p> <p><b>Richard Parsons – sounds like complex issue, not a priority, demand seems limited.</b></p> <p>NS – could the EA look at the EoW process for TAD? Are companies sufficiently interested? The SG noted that no submissions had been received from aerobic digester operators for this review.</p> <p>CH – If companies require an EoW category, then, as with any other waste handler, they can bring forward information to justify EoW, using generic advice on how to submit EoW submission. But the EA would not promise to take direct role in preparing another PAS specifically for aerobic digestion. Aerobic digestate already has a route to market, albeit as waste</p>	
<b>ACTI ONS</b>	<p><b>The majority of SG members agreed that the issue was too complex – no action for this review.</b></p> <p><b>Interested parties may submit information to the EA to justify and support any claim that aerobic digestates meet EoW criteria.</b></p>	<b>No PAS110 action</b>

<b>5</b>	<b>The requirement for and measurement of digestate stability</b>	
<b>5a</b>	<ul style="list-style-type: none"> <li>• <b>What is the digestate stability test for?</b> <ul style="list-style-type: none"> <li>○ Regulatory view – EA / SEPA</li> <li>○ Consultation feedback – DST</li> <li>○ Discussion – All</li> </ul> </li> </ul>	
	<p>RP – proposed is to split the discussion into two parts:</p> <ul style="list-style-type: none"> <li>• What is the digestate stability test for and is it required?</li> <li>• Is the RBP test the right one?</li> </ul> <p>CH – A test is required to demonstrate that the waste recovery process is completed – based on case law and the Waste Framework Directive (WFD). If a producer cannot demonstrate full recovery then they cannot satisfy EoW. This is the legal position on why a test is required. The test that currently fulfils this purpose is the RBP test. As part of the determination of end of waste, comparison is necessary with a virgin material that is replaced by the recovered waste.</p> <p>DT – clarification – what was the virgin comparator material against which the RBP test was compared?</p> <p>VD – Cow Manure was the comparator – the precise source (feed / product type) was not defined. Comments from SG members that different sources have different RBP values.</p> <p>PP – clear that 0.25 litres biogas/gVS is not reliable.</p> <p>EN – In the original RBP work only 10 samples of various possible comparators were analysed (2 cattle slurry, 2 pig slurry and 6 digested sewage sludges) – this is a small dataset which leads to problems benchmarking against these. Subsequent WRAP work examined a larger number of samples (5 cattle slurries, 1 mixed pig and cattle slurry, 4 pig slurries). Four of the five cattle slurries had RBP below the threshold, while all of the other samples were above it. What is the range of manures applied to soils? There is no clear relationship between odour potential and RBP values.</p> <p>CH – The EA is using the RBP test as a test for clear recovery not necessarily as an odour mitigation test. Not saying that the relationship between high RBP value and odour is strong, but that we are looking at the threshold of complete recovery. The question is, is there evidence that a different threshold value can be applied? We would need to look at the evidence.</p> <p>DT – What is purpose of PAS110, is it product for market or a process for regulation or both?</p> <p>CH – The biowaste AD community must decide what it wants in PAS110 to demonstrate suitability for the market. Then the EA takes a view on whether the standard demonstrates EoW.</p> <p>MO – Composts have different odour characteristics to Anaerobic Digestates, so it's unclear whether the different stability tests in the two PAS's are intended to serve the same function (odour management or test of recovery?)</p> <p>EN – The RBP doesn't really show extent of recovery of material as currently there is no starting point measurement. Other parameters measured by operators during digestion provide data used for control/management of the AD</p>	

	<p>process. The digestate should be tested for its fitness to be spread on land its impacts on receiving soils / crops etc. No evidence has been shown for RBP values having a relationship with impacts of digestates on receiving soils and plants.</p> <p>DT – If the aim is to demonstrate recovery and that aim is not potentially appropriate for the PAS where else could it be achieved?</p> <p>CH – The only other place it could be achieved is the QP - not appropriate. If PAS110 does not include a test to show how digestates can meet EoW, then we become dependent on a permitting system.</p> <p>DT – Could the requirement to demonstrate full recovery be placed in the permit for operating the plant itself, as this is about process rather than digestate output?</p> <p>CH &amp; VD - It is difficult to put conditions into an operating permit to demonstrate recovery. An operating permit cannot insist on an end point; this would not be a legal control. NS summarised – The EA needs demonstration of full recovery for EoW; the AD Quality Protocol sets out these criteria. The easiest place to put specific requirements for AD is in PAS110.</p> <p>CH AJ – Agree</p> <p>PP – With the PAS 100 the limit was relaxed to a very low value. The directive (WFD) indicates that any test needs to be proportionate, but the RBP value is not proportionate.</p> <p>RP – shall cover this next</p>	
<b>ACTI ONS</b>	<b>EA to set out the requirements that demonstrate full recovery from wastes including a summary of case law related to the Waste Framework Directive (WFD). (<i>Action put against this section from offer made by CH in minutes in section 5b below</i>).</b>	<b>Environment Agency</b>
<b>5b</b>	<ul style="list-style-type: none"> <li>• <b>If a stability test is required, is the RBP the right one?</b> <ul style="list-style-type: none"> <li>○ Are there viable alternatives? – All</li> <li>○ How should the limit be set? – All</li> </ul> </li> </ul>	
	<p>DT – The consultation produced some detailed responses, but less feedback on alternatives. Measurement of VFAs was noted as insufficient for process stability control alone; other determinants are also used. The RBP test is stated to be lengthy, expensive, and have an unclear purpose.</p> <p>NS – Important to note is that there wasn't a clear answer with what we were given in terms of responses.</p> <p>DT – WRAP work in the past has looked at equivalence tests (to the RBP), not starting afresh to examine or develop alternative approaches.</p> <p>PP – We need to know rapidly what we are to have; to find something that works now, and then properly research another approach. In the first instance the current RBP conditions need to be relaxed.</p> <p>DC – The RBP test takes 28 days, which becomes 42d after taking and sending sample to lab before operator gets the result from the lab; if a digester has 60d retention, the minimum sampling interval for test submission will be 60 days, adding hugely to the time needed to validate against PAS110. These intervals are compounded during validation, when plants need to achieve three passes in</p>	

	<p>a row. Plants don't always know why they are failing the test although the WRAP AD doctor service gave some help. There is enormous pressure for plants to pass; eg. local councils demand that PAS110 is met for treatment of their wastes.</p> <p>MO – In addition to timescales RBP test failure becomes a big problem as digestate suddenly becomes a waste material so requires an environmental permit. The test is very contentious.</p> <p>PP – AnDigestion is currently in this position – better to run under permit system rather than PAS. Might have a very slight change to plant and then it fails RBP so very difficult to run under PAS. What does full recovery mean? it's a big test to achieve which might require big investment, which turn out to be a bad investment. May be better to recover less and still be more efficient overall. Problem of base level with insufficient evidence.</p> <p>MO – consequence of failing PAS has large Local Authority knock-ons. PAS was never designed to be a tool for contracts but now is.</p> <p>NS – There are difficulties with the current process, but still need a test for the EA to accept a digestate meets the EoW criteria. If we change the limit value then the various UK Environment Agencies would have to agree that the change is acceptable.</p> <p>CH – The EA would need evidence to accommodate a shift in approach or values.</p> <p>EN – There are possible fixes to reduce the cliff edge effect of a single failure. Processes currently have to have a QMS. Perhaps an operator could show, through process monitoring parameters and gas yield data, that the process is being operated such that it's achieving the maximum biogas yield <u>rate</u> that's feasible, given the characteristics of the feedstock mixture?</p> <p>CH – EoW requires full recovery (PP interject must be proportionate). Cannot have nearly full recovery or reasonable recovery, but can look at the finishing line.</p> <p>EN – In that context optimal recovery is full recovery so could we demonstrate that in this context?</p> <p>AJ – We must have test to show that digestate is a product. The RBP test is clumsy (time, failures). What is the European approach?</p> <p>NS – A variety of other approaches have been used but there is no equivalence between them i.e. the test in one member state is very different from the test in another member state.</p> <p>PP – Digestate put on land must not damage soil. As regard operation of process plant this is a QMS matter and is not something which should be demonstrated through an end product test. Has 10 years experience of applying to digestate to agricultural land as a biofertiliser; digestate is in demand, so relaxing the value would be welcome. The EA should not be considering gas alone but should take a holistic view with regard to impact of processes required to extract all available energy. We should be concerned with the use of the energy not where we get the last drop of gas from. Digestate doesn't give off methane after recycling onto agricultural land.</p> <p>CH – The discussion has very much focused on energy but PAS110 is about material to substitute for cow manure. Not trying to determine the amount of</p>	
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	<p>energy recovery from material, but must demonstrate full recovery for EoW – this is recovery of waste not just gas.</p> <p>AJ – How representative is cow slurry as a comparator?</p> <p>VD – If the PAS110 RBP virgin comparator used was sewage sludge then the standard would be tougher.</p> <p><b>Richard Parsons (Chairman) – what alternative approaches could be used?</b></p> <p>NS – A way forward could be to have workshop involving other operators and academics to discuss all available evidence and try to arrive at a more considered position for general consultation. The steering group would need to agree the key questions and issues to be addressed</p> <p>MO – Could a rolling average of RBP measurements be used? The impact of a single failure could be reduced.</p> <p>CH – Need to take back this question – is this consistent with EoW?</p> <p>PP – This issue is so important that if a contractor lost work by failing a test there is likely to be a judicial review.</p> <p>CH – The PAS110 must be sufficiently robust to satisfy EoW – but may be possible to include conditions for amalgamation of more than single tests. Need proposal for EA to test against evidence.</p> <p>PP – Could a route be to not have PAS110 as the EoW test, but instead use QMS?</p> <p>CH – The EA looking at PAS110 to define the test of EoW status; cannot use a QMS as EoW criterion test.</p> <p>EN – At the point where you demonstrate full recovery the EA seems to be saying that the digestate must be comparable with a non-waste material that's used in a similar way in a similar context, so we're coming back to what that should be e.g. cow slurry or something similar in the context of agricultural use. There is also the discussion whether the limit value is appropriate and how to make the PAS criteria more workable.</p> <p>DC – The lab difficulties with the RBP test are significant.</p> <p>PP – There is large variance between different labs. Note that PAS0 principles identify that the standard should not be unduly restrictive to stifle competition and should not be anti-competitive.</p> <p>CH – Still need to determine EoW regardless of difficulties experienced.</p> <p><b>Richard P – What is the view of this meeting on NS's idea on a workshop? – review alternatives, check with agencies on appropriateness?</b></p> <p>MO – Is the cow slurry standard suitable for RBP test? Is the figure typical of what it is and should this be the starting point.</p> <p>DT – If the stability test is retained as it is then yes this is a key question. But my question would be is it the right comparator.</p> <p>CH – During PAS110 preparation the EA agreed to look at evidence on virgin comparators if it was brought forward. The length of time the test takes is also a problem.</p> <p>NS – Evidence in comparison to what we had available in 2010 has greatly</p>	
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	<p>improved. There is a lot more to go on now.</p> <p>PP – Recovery from waste and suitability for land use are two different aspects, and should be dealt with differently. If you're going to be proportionate in the test, and they can be in the same test, but it needs a different system one which demonstrates you are recovering a proportionate amount of the gas that's in there that's commercially sensible and another one which demonstrates that what goes on the land is sensible.</p> <p>CH – Not saying it can't go on the land but in legal terms there is a point at which they don't come under the controls of the WFD. This is all about mechanisms whilst working within confines of legal constraints.</p> <p>EN – There is a problem with different inputs which have much greater gas potential than the original comparators, which makes achieving the marker RBP value much more difficult. As such, benchmarking the RBP against <u>cow</u> slurry may not be suitable.</p> <p><b>Richard P – should we have workshop on:- the current RBP test; and what alternative tests could be used?</b></p> <p>DC – We need more detail on what elements contribute towards full recovery, we can then suggest tests which would satisfy those elements</p> <p>CH – Offered to assemble a summary of the way in which the case law around the WFD is applied, and how a test to demonstrate recovery might be considered acceptable.</p> <p><b>The SG accepted this offer to prepare these statements of policy and practise (See ACTION for item 5a).</b></p> <p><b>NS - proposed to work up an action plan for a workshop on stability measurement and the RBP test, based on the discussion for items 5a and 5b, to be informed by the EA paper on recovery. This proposal was accepted by the SG.</b></p> <p>It was agreed that success of the workshop need a high level of operator involvement and that trade bodies would need to encourage involvement, including supply of data.</p>	
<b>ACTI ONS</b>	<p><b>WRAP to work up action plan for a workshop with the objectives to secure a consensus position on a test that demonstrates recovery of waste through anaerobic digestion – stakeholders' evidence required on values, test; suitable question required to pose to industry in advance of this workshop.</b></p> <p><b>Trade bodies to help in organising the workshop and bringing operators together.</b></p> <p><b>WRAP to sort out a starter document on questions that could be addressed in this workshop – to put out to consultation within the Steering Group, and thence to the wider AD community</b></p>	<p><b>WRAP</b></p> <p><b>Trade bodies</b></p> <p><b>Operator s / trade bodies</b></p>

<b>6</b>	<b>Potentially toxic elements (PTEs)</b>	
<b>6a</b>	<ul style="list-style-type: none"> <li>• <b>What is the impact of the current limits?</b> <ul style="list-style-type: none"> <li>○ BCS scheme view – DC</li> <li>○ <b>The laboratory view – SS</b></li> <li>○ <b>Possible future impacts – DST</b></li> <li>○ <b>Discussion – All</b></li> </ul> </li> </ul>	
	<p>DT – PAS 110 PTE limits are currently set on a DM basis – but current UK material has low DM, therefore operators have stated that it is difficult to guarantee passes, especially in the case of separated liquors which tend to have very low organic matter content. ADAS UK compared PTE loading rates from UK digestates to loading rates considered acceptable for composts under PAS100, and the EU JRC recommendations (for compost) from 2012. At present PAS110 includes an opt-out, whereby digestates exceeding the PTE thresholds can still seem to comply with the PAS as long as the PTE loading rates to soil do not exceed those in the Sludge Use in Agriculture (SUA) Regulations (1989) on a 10-year rolling average. This opt-out is impossible to audit unless digestate is traced from producer to field, placing an additional burden on the digestate producer. None of the digestate data for PAS110 sites considered by ADAS exceeded the PAS110 PTE thresholds. However, digestate data from some sites that might wish to become PAS110 accredited in future did exceed the PAS110 PTE thresholds. The SG were invited to consider whether PAS 110 should set PTE limits on a fresh matter basis.</p> <p>DC – PTE test is now higher profile, and if rolling average option were to be removed it would become critical to operators. From NRM data on Cd, Zn, Cu, some plants are exceeding the PAS110 PTE limits, some of the time.</p> <p>EN - Under the latest JRC proposals, where digestate Cu is between 100 and 200 mg/kg dm and/or Zn is between 400 and 600 mg/kg dm, the producer must make customers aware of the Cu/Zn concentration in the digestate. Could PAS110 digestates be controlled in a similar way in future, so that users can decide how to use these digestates? Please can WRAP ask ADAS to re-model their proposed digestate PTE limits on a fresh weight basis, given that it's possible that JRC will set a Cu limit of 200 mg/kg dm and Zn limit of 600 mg/kg dm in prospective EU EoW criteria? <b>[Please note that fresh weight calculations used to compile the ADAS report can be found in the spreadsheets attached to the email].</b></p> <p>EN – The European debate so far aims to satisfy the majority of EU states by setting PTE limit values that are a compromise between the strictest limits that some Member States use and more relaxed limits that the majority of other Member States use. They are taking into account available quality data and considering limits that are 'As Low As Reasonably Achievable'. Data on Cu shows most failures.</p> <p>DT – <b>Do we need to change anything?</b> Using the ADAS data (from the consultation paper), for 51 data points for whole digestate –there would be some failures for some PTEs if some of the digestates were to be considered for PAS110 certification in future, but at the time the data were analysed, none of the PAS110 digestates exceeded the limits (<i>highlighted for individual PTEs in a displayed slide showing spreadsheet comparison of data</i>). For separated liquor and fibre digestates some failures of Zn and Cu would be likely in the future.</p>	

	<p>EN – The Biofertiliser Certification Scheme has data from NRM, from PTE analyses in 2010 &amp; 2011 which shows that samples of each digestate type (whole, separated liquor and separated fibre) exceeded at least one of the existing PAS 110 limits some of the time. This seems different from what the ADAS data shows.</p> <p><b>DT - Is it appropriate to use DM as the concentration comparator?</b></p> <p>SS – Explained that NRM use a variant on the specified method for liquid digestate measurements that does not first require isolation of dry matter (for subsequent acid digestion and analysis in the laboratory)</p> <p>EN - If a liquid sample has not been fully dried are all the PTE elements fully extracted during such a 'wet' laboratory digestion?</p> <p>DT – Disappointing to learn that the specified method had not been used but understand how this has occurred since the specified method is not particularly intended to cover low dry matter materials (large sample volumes are needed to derive the dry matter necessary for the test).</p> <p>NRM could look at comparing their 'manures' method with the specified method. The revision could consider replacement of the specified BS EN 13650 and ISO 16722 (for Hg) methods of test for metals determination using a more appropriate method.</p> <p>VD – Is extraction using aqua regia acid the same from 'dried liquid' as from slurries?</p> <p>SS – There are problems in drying down large volumes of 0.2-0.3% DM materials. Offered to provide data to the SG comparing data for samples analysed using both the specified BS EN 13650 method and the NRM 'manure/slurry' methods. To carry out this comparison NRM may need some help from operators, but SS is happy to make arrangements with the operators with whom they are carrying out normal analyses.</p> <p><b>The SG welcomed this contribution to assist understanding consequences of different measurement methods.</b></p>	
<b>ACTI ONS</b>	<p><b>WRAP to circulate ADAS data in the displayed spreadsheet after this meeting. EN to send additional data from 2010/2011</b></p> <p><b>SS to contact operators if necessary to obtain samples suitable for submission to the different PTE tests (PAS110 specified vs NRM methods)</b></p> <p><b>SS to provide resulting data to SG</b></p> <p><b>EA to consider data submitted</b></p>	<b>WRAP NRM Operator s</b>
<b>6b</b>	<ul style="list-style-type: none"> <li>• <b>Do we need to change the current approach?</b> <ul style="list-style-type: none"> <li>○ <b>Regulatory view – EA / SEPA</b></li> <li>○ <b>Consultation feedback – DST</b></li> <li>○ <b>Possible options – DST / All</b></li> </ul> </li> </ul>	
	<p>SS – NRM could get data together to compare wet and dry matter approaches to PTE testing (<i>see offer and action above for item 6a</i>).</p> <p>EN – There is uncertainty about whether NRM's current analytical approach is providing similar results as would be obtained if they used BS EN 13650.</p>	

	<p>[Laboratories are expected to use the methods specified in PAS 110, not different methods.]</p> <p>CH – The EA is open to considering a change to the PAS 110 PTE limits, such that they are set on a fresh instead of dry matter basis. Supports a review of the data to find if there is under-reporting of PTE concentrations (due to lack of use of specified method); and then review acceptable methods and values.</p> <p>NS – There is a reason to change [to setting PTEs on a fresh matter basis] – but need to look at results to check comparability. Then put to regulator.</p> <p>ACTION - NRM to come back with data comparing the different methods. Might need some help from operators.</p> <p><b>DT – Could we remove limits entirely, given the low concentrations found in digestates?</b></p> <p>CH – The EA would not be inclined to accept this.</p> <p><b>DT - Do the PTE limits need to stand against any virgin material comparator?</b></p> <p>VD – The sewage sludge limits should be used as the base.</p> <p>DT – Displayed the approach used in Ontario, Canada, showing two values for fresh weight with low concentration materials. Brief discussion of the advantages by the SG did not lead to any further decision on approach.</p> <p>The SG agreed that the NRM comparison data would be used to inform the next consultation. The appeared to be no urgent need for reform.</p>	
<b>ACTI ON</b>	<b>AGREED - Having no metal limit values is not a choice</b>	<b>ALL</b>
7	<b>The requirement for pasteurisation</b>	
	<ul style="list-style-type: none"> <li>• <b>Do we need to retain the pasteurisation requirement for non-ABP inputs?</b> <ul style="list-style-type: none"> <li>○ <b>Consultation feedback / summary of evidence – DST</b></li> <li>○ <b>Regulatory view – EA / SEPA</b></li> <li>○ <b>Discussion – All</b></li> </ul> </li> </ul>	
	<p>DT – Produced a diagram showing four treatment modes used to process biowastes (appendix 1). The PAS110 conditions allow biowastes generated ‘on holding’ to remain un-pasteurised if they are to be used on the same holding (this option does not apply to Animal By-Products, for which there are regulatory pasteurisation requirements). Biowastes arising from other routes or digestates intended for use on other holdings must be subject to a pasteurisation stage at some point (pre or post anaerobic digestion – the PAS does not specify which). Although the evidence suggests that AD itself will eliminate plant pathogens, weeds and other phyto-hygiene hazards of agricultural interest, there is always a chance that feedstock will by-pass an AD process in a ‘fill and draw’ system – meaning that such systems cannot guarantee sanitisation in the same way that a discrete pasteurisation step can (because this latter cannot be by-passed).</p> <p>CH – If you are putting manure or purpose-grown crops through AD then the</p>	

	<p>resulting digestate would not normally be treated as a waste.</p> <p><b>Richard Parsons – was there any feedback from the market based / consumer organisations?</b></p> <p>DT – No feedback from cereal growers or from maltsters. Informal feedback from HGCA is that they are not concerned about potential risks from Fusarium (as the causative organism for mycotoxins in grain).</p> <p>EN – There is currently no restriction on where in a process pasteurisation is carried out. This links to issue about plant pathogen indicators and testing, if we can agree a practical a solution on end product testing it would enable more flexibility on whether to pasteurise purpose grown crops or not.</p> <p>DT – While the evidence suggests that the AD process itself can have a reductive or eliminative effect on biological hazards of interest, the biochemical environment (which exerts these effects) within AD systems cannot be guaranteed. This means that there is generally a reliance on overall time and temperature effects, as these are the easiest to control in a repeated fashion.</p> <p>DT – One option might be to pasteurise all ABP materials according to Animal Health requirements, but for non-ABP inputs to be subjected to a different time/temp approach.</p> <p>DT – Distillers are very keen for their waste products not to be required to be pasteurised as effective prior thermal treatment has already been carried out in the production process.</p> <p>Manures and slurries – may not need PAS110. Purpose grown crops are not currently regulated under PAS110 if they are used on the holding on which they are produced. So is it appropriate to insist that these are pasteurised in the PAS? (worth cross-referencing with diagram, since some AD operators have already invested in equipment that allows all materials to be pasteurised. It could be stated that these operators are producing digestate with a clear market advantage (in terms of demonstrable plant pathogen control) and have invested in the process. Should future operators be subjected to less stringent requirements and still be considered PAS110 compliant?)</p> <p>PP – Has the Soil Association been consulted?</p> <p>NS – not yet but they will be consulted</p> <p>DT – Previous feedback suggested that any GM material [food wastes are likely to include some GM content] was unacceptable for Soil Association locations regardless of pasteurisation status.</p>	
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	<p>MO – Might be a benefit in extending the “holding / premises” approach to enable a co-operative area. Care would need to be taken in defining the extent of a co-op as holding.</p> <p>EN – How comfortable are we with plant pathogens potentially transferring between locations?</p> <p>MO – It’s still effectively contained with the holding, but it’s just bigger.</p> <p>DC – The land holder should understand the risks.</p> <p><b>Richard Parsons – It’s about line of sight of risks, and accepting those risks.</b></p> <p>CH – It’s about confidence of users.</p> <p>MO – Lack of red tractor participation causes us problems today in considering options for change.</p> <p><b>NS – We are talking about both what’s required for EoW and what would be required for market acceptance.</b></p> <p><b>NS – We can go to consultation with a number of questions and options on this:</b></p> <ul style="list-style-type: none"> <li>• Holdings</li> <li>• Plant Pathogens</li> <li>• Validated regimes e.g. FERA approach</li> <li>• Non-ABP</li> </ul>	
<b>7b</b>	<ul style="list-style-type: none"> <li>• Are there options for change?</li> <li>• Possible extension of current on-farm and co-operative approaches – All</li> </ul>	
	<p>PP – Farmers will not be happy without pasteurisation of slurries.</p> <p>DT – what about the risk assessment approach? Idea from FERA (Generally seen as acceptable, but no risk assessment framework in place at present. How auditible would such a thing be?)</p> <p>EN – If we could arrive at single plant pathogen indicator organism for the validation testing [to demonstrate control of plant pathogen risks] then that would help.</p> <p>General SG discussion on details of the outcomes from the pasteurisation consultation document prepared by FERA et al; impact of treatments on different marker phytopathogens and their importance. The cost of carrying out validation tests may be significant; <b>DT has sought information from FERA on possible costs for Fusarium testing – please see appendix 2</b></p>	

	<p>The SG recognised potential for adjustments – however lack of information and details of needs means that the public consultation needs seek responses on detailed questions for possible changes.</p> <p>WRAP (NS &amp; DT) agreed to approach farming organisations for comments, and to prepare detailed consultation questions.</p> <p>General support within the steering group to identify areas where a flexible approach can be accommodated where appropriate.</p>	
<b>ACTI ONS</b>	<p><b>To consult and prepare consultation questions as below:</b></p> <ul style="list-style-type: none"> <li>• Consult with Farmers / farming organisations</li> <li>• Issue of defining holding / premises scope</li> <li>• Is there a definition of time / temperature</li> <li>• Validation regime – what species organisms to use for pasteurisation.</li> <li>• Ask FERA to cost up testing – COMPLETED (please see appendix 2)</li> <li>• Draft options for the consultation</li> </ul>	<b>WRAP</b>
<b>8</b>	<b>Other issues raised through the pre-consultation responses</b>	
<b>8a</b>	<ul style="list-style-type: none"> <li>• Digestate odour management <ul style="list-style-type: none"> <li>○ Consultation feedback – DST</li> <li>○ Discussion – All</li> </ul> </li> </ul>	
	<p>The SG considered that odour issues have not been a concern and that the use of the current Code of Good Agricultural Practice is satisfactory in regard to agricultural recycling.</p>	
<b>ACTI ON</b>	<b>No change - Code of Good Agricultural Practice is sufficient</b>	
<b>8b</b>	<ul style="list-style-type: none"> <li>• Physical contaminant limits <ul style="list-style-type: none"> <li>○ Consultation feedback – DST</li> <li>○ Discussion – All</li> </ul> </li> </ul>	
	<p>DT – Should a fresh weight basis be used in terms of physical contaminants?</p> <p>EN – There is a good case for a more generous limit for low solids separated liquors.</p> <p>NS – Given that we've considered metals on fresh weight basis then argument for contaminants on fresh weight.</p> <p>VD – Issue is difference with surface retention of contaminants in liquid material compared to solid matrix in which plastic may be present – visual impact of physical contaminants from liquid which sinks into soil leaving contaminants on surface may be greater than contaminants dispersed and less visible in solid materials.</p>	

	<p>DT - Need to discriminate between EoW and market requirements, versus practicalities of what's possible.</p> <p>EN – What data are there on known amounts of contaminants?</p> <p>DT – No data were provided in feedback.</p> <p><b>Richard Parsons – what data would be needed?</b></p> <p>DT – We could model loading rate equivalents that are currently used for composts in considering new limit value(s).</p> <p>The SG recognised the potential for adjusting approach but needs more data.</p>	
<b>ACTI ON</b>	<ul style="list-style-type: none"> <li>• <b>No need to make changes for measurement in fibre</b></li> <li>• <b>Model impacts using loading rates for composts.</b></li> <li>• <b>Request data from operators on physical contaminants.</b></li> <li>• <b>Consider new limit value and consult</b></li> </ul>	<b>WRAP</b>
<b>8c</b>	<ul style="list-style-type: none"> <li>• <b>Digestate storage and the need for cover</b> <ul style="list-style-type: none"> <li>○ Regulatory view – EA / SEPA</li> <li>○ Discussion – All</li> </ul> </li> </ul>	
	<p>DT – Requirements for covers and suitability of cover types was discussed in the earlier workshop on PAS110. There was some uncertainty as to whether this was a regulatory requirement or PAS-specific</p> <p>CH – Operators have moved to cover storage locations because of loss of ammonia and associated odour. Need to understand if there are counter arguments i.e. is it appropriate not to cover. Cover could be a floating cover. Worth considering if evidence gives a case for more substantial cover. Issue is that of emissions. Some minimal risk of recontamination from other sources.</p> <p>EoW only applies once material has been despatched from the site of production, so EoW does not apply whilst a digestate is on site. From an environmental point of view then it may be appropriate to cover the material before EoW applies.</p> <p>PP – AnDigestion choose to cover (due to rainwater dilution issues, ammonia escapes, whilst methane emissions are low from digestate). Do we really need to regulate for covers?</p> <p>DT – perhaps PAS110 should not define requirement for covers as it should be in the permitting arrangements for the site.</p> <p>PP – What about tanks on other farms, not under the producer's own control? AnDigestion have found need to control these tanks.</p> <p>There was general discussion on extent of locations to which the covering</p>	

	<p>requirement should apply. This is also related to the consequences of product being taken off the production site and transferred to holding tanks or locations elsewhere, including within a single organisation (eg. a co-operative) but at a different geographical location. This is important as there are good reasons for off-production site storage before use. Intermediate storage locations not on the premise(s) where the digestate would be used were also discussed.</p> <p><b>CH – offered to provide summary guidance on when EoW applies. Should not be matter of ownership. This would clarify what happens when PAS110 material is moved and stored before spreading</b></p> <p>MO – remote holding tanks will become more important.</p> <p>EN – PAS 110 requires coverage of digestate until it has been dispatched. Large floating covers can be a problem, e.g. impractical to cover a large lagoon and nature of cover material must not negatively affect liquid digestate's quality and pumpability when being spread.</p> <p>CH – A case could be made for not covering within the permitting arrangement for the production process. The issue is of when permitting changes to EoW criteria requirements. Any conditions set in PAS110 must take developing practices into account.</p>	
<b>ACTI ON</b>	<b>Preparation of summary guidance on when EoW applies. Should not be matter of ownership. Clarify what happens when PAS material is moved and stored before spreading</b>	<b>Environm ent Agency</b>
<b>8d</b>	<ul style="list-style-type: none"> <li>• <b>Are the current sampling intervals appropriate?</b> <ul style="list-style-type: none"> <li>○ <b>Example – RBP test during validation – DC</b></li> <li>○ <b>Discussion – All</b></li> </ul> </li> </ul>	
	<p>DC – The RBP sampling and measurement is the main issue here [outlined in Section 5b, above]. At present, during validation, three-in-a-row passes must be achieved for all determinands, with samples taken at intervals consistent with the mean hydraulic retention time. So, if your mHRT is 90 days, then 270 days must have elapsed before your third sample could be sent for testing – and if you awaiting the results of all tests between sampling, this period could be considerably extended.</p> <p>PP – digestion is a continuous process with some variation in retention times (according to feed type, performance of plant) so need flexibility in the standards – it is not a batch process.</p> <p>DT – should the validation period be extended to demonstrate consistency (or at least, to encompass typical variability) over a standard period of one year?</p>	

	<p>EN – Perhaps change to reduce intervals taking into account the extent of change of material under digestion. Perhaps the interval between taking each sample of liquid digestate (for validation testing period) should be based on how long it takes to replace at least half the material in the storage tank [or double the amount in the storage tank if no digestate were pumped out between taking the first and next sample]? SG discussion on this related to whether it is practical to accurately monitor the amount of material present in the storage tank when sampling and work out or track how quickly <math>\frac{1}{2}</math> of that volume becomes pumped in or replaced, and its relevance.</p> <p>PP – might not have exact knowledge of amount of material in a storage tank at any one time. Also need flexibility to dispatch direct from digester when occasion demands.</p> <p>EN – Under such an approach the operator could dispatch from the storage tank whenever occasion demands. The AD operator would not be expected to keep everything in the storage tank after 1 sampling exercise until the next sampling exercise.</p> <p>The SG reviewed and discussed the cost of each complete sample for all required determinands - £250 for suite without RBP, £750 with RBP (there is just a single RBP supplier, the OU). The validation period is a particular issue, with the current requirements resulting in potentially very long periods before a digester may be validated as meeting PAS110 requirements (and hence EoW requirements).</p> <p>The SG discussed if there is any reference in the PAS110 to validation before digester operation is at capacity? And if 28d sampling be used? Both of these enquiries were in relation to achieving earlier performance validation data.</p> <p>DT – Are there data to show variation in determinands? These would be evidence to inform the necessary frequency of sampling. For example, are there monitoring data on PTEs?</p> <p>NS – It is important to ensure that we have right sampling for the validation phase.</p> <p>Whilst there was agreement that change was necessary, there was no consensus on what this change should be, other than that it would be desirable to consider data illustrating the variability or stability of digestion processes over a period of some time (perhaps one year).</p> <p><b>It was proposed that the PAS110 consultation process request data to support a change to 28d sampling rates. And seek further evidence of need for change to the current conditions.</b></p>	
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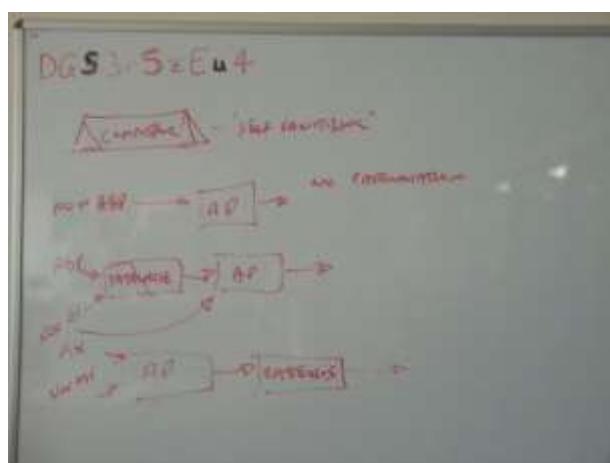
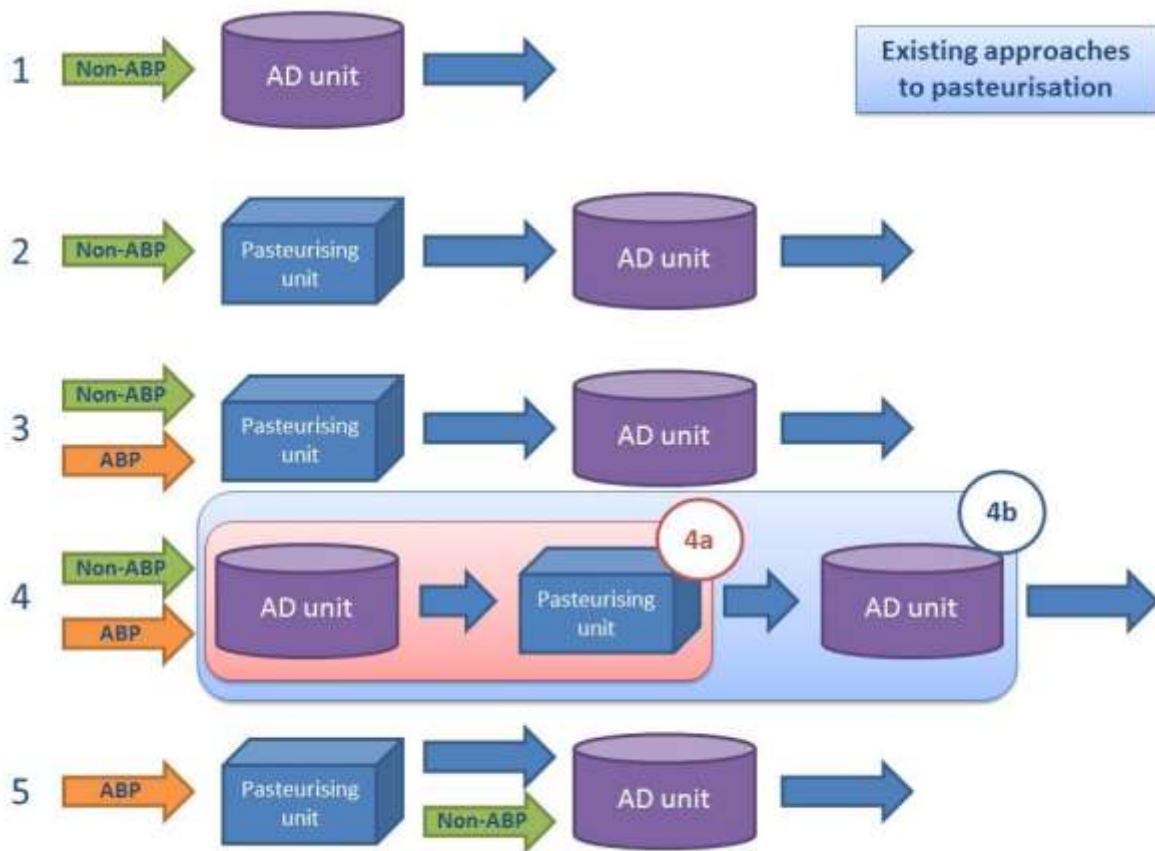
	At this point the SG also raised the possibility of using some form of interactive consultation forum, to allow discussion of feedback. No specific action on this was identified.	
ACTI ON	<p><b>In the consultation ask for</b></p> <ul style="list-style-type: none"> <li>• Data on digestate quality at frequent sampling intervals – for example, at 28d sampling intervals – to demonstrate process variability or stability. Such data might be for PTEs or indicator pathogens etc.</li> <li>• Evidence of need for change.</li> </ul>	WRAP / Operator s / Trade bodies
8e	<ul style="list-style-type: none"> <li>• Does 'significant change' need to be defined in the PAS110? <ul style="list-style-type: none"> <li>○ Example – DC</li> <li>○ Discussion – All</li> </ul> </li> </ul>	
	<p>DT – at present significant changes can trigger re-validation, with the regulatory and financial difficulties that this will prompt. To facilitate the job of the auditors, should significant change be defined?</p> <p>PP – Significant change should be identified by the QMS.</p> <p>DC – Does significant change always mean that you need to test again?</p> <p>PP – The need to test again should depend on the purpose of retesting – Is the purpose of testing as a process monitor or field monitor. Operators need to be able to experiment, to improve process, so must have process flexibility.</p> <p>EN – It is very difficult to define what changes affect quality. For example – for some measures or conditions a 20% change might affect the quality of product – but others don't.</p> <p>The SG had no firm view at this time; this should also go out to consultation, but current view was that no change to the current definition or guidance is required.</p>	
ACTI ON	<ul style="list-style-type: none"> <li>• Include this in the consultation – but with the proviso that the SG considers no change to this is required.</li> </ul>	ALL
8f	<ul style="list-style-type: none"> <li>• Is 'point of despatch' adequately defined? <ul style="list-style-type: none"> <li>○ Example – DC</li> <li>○ Discussion – All</li> </ul> </li> </ul>	
	<p>PP – Sampling should be at time of despatching the product (loading the lorry), as it is essential to know what is going to a customer. The problem is that of mixing the concept of assuring farmer of right product and the concept of full recovery.</p> <p>The SG took the view that currently no change is required, but will invite comment. From the point of view of stability it is essential to be clear where and when sampling is made.</p>	

ACTION	<ul style="list-style-type: none"> <li>• Currently no change, but invite comment</li> </ul>	WRAP
8g	<ul style="list-style-type: none"> <li>• Is the current requirement to test for water soluble Na and Cl (sodium and chloride) appropriate?           <ul style="list-style-type: none"> <li>○ Discussion – All</li> </ul> </li> </ul>	
	<p>EN – is this needed?</p> <p>SG discussion on whether conductivity (EC) could be used instead, and whether the measures were even required for general use of digestates. Agricultural use does not require these measures.</p> <p>Since no-one was aware of any use to which these data could be put, the SG agreed to remove this requirement from PAS110</p>	
ACTION	<b>Remove the requirement to test for water soluble Na and Cl (sodium and chloride) from PAS110</b>	Tech Author
8h	<ul style="list-style-type: none"> <li>• Is it important if de-packaging takes place before or after digestion?           <ul style="list-style-type: none"> <li>○ Example – DC</li> <li>○ Discussion – All</li> </ul> </li> </ul>	
	<p>The SG was informed that a couple of operators would like to remove packaging from digestate after digestion. There may be advantages in this for some types of operation including improved separation. The problem of glass fragments in final digestate, particularly in fibre, was highlighted in discussion.</p> <p>CH – Wherever possible contaminants should be removed before treatment.</p> <p>EN – Further information on the applications could be obtained. We understand that operator requests relate to a quite specific stream of waste, for which operators think it would be better to shred first and separate later. Example raised by operator was removal of plastic.</p> <p>DT – Does this type of application tend to undermine the definition of source segregation?</p> <p>CH – The Quality Protocols rely on limiting inputs to AD processes; non-biodegradable inputs would not be considered as acceptable inputs, and should be removed prior to digestion.</p> <p>VD – Pre-shredding of plastics can reduce them to less than 2mm (less than the standard for contaminants) so it is a problem.</p> <p>PP – It is possible that production of energy may be improved by including material that otherwise adheres to packaging.</p>	

	The SG decided that no action was justified at this time, and that this matter should be included in the consultation.	
<b>ACTI ON</b>	<b>No action at this time - consultation</b>	<b>WRAP</b>
<b>9</b>	<b>Summary of noted action points - technical author</b>	
	Rod Palfrey - Action points taken during the meeting were reported in order to the meeting	
<b>10</b>	<b>Summary of next steps - Chair</b>	
<b>11</b>	<b>Critical next dates – Chair</b>	
	<p>NS – Propose to circulate the actions in 10 days and request confirmation that they are agreed. WRAP will start the process of putting together a workshop. A starter paper will be prepared and then workshop meeting dates proposed. This is expected to take the process up to July/August.</p> <p>There was an offer to meet with operators outside the Steering Group, to obtain relevant data to bring back to the Steering Group</p> <p>Next convening of this Steering Group is expected to be in Summer / Autumn period.</p> <p>Input from workshop will go to consultation which is expected to not require a meeting to agree the consultation details.</p> <p>Public consultation will need 6 weeks. This is formal consultation. The SG will review the consultation responses to decide where changes may be made.</p>	
<b>ACTI ON</b>	<b>Circulate actions from this meeting Prepare starter paper for workshop Workshop meeting dates to be proposed Meet with operators to gather data to bring back to Steering Group</b>	<b>WRAP</b>
<b>ACTI ON</b>	<b>BSi dates for SG meeting</b>	<b>BSi</b>
<b>12</b>	<b>Close</b>	
	<b>MEETING CLOSED AT 15.40pm</b>	

## Appendix 1:

Overview of pasteurisation option: All of these options require different degrees of investment, and may result in different degrees of phyto-hygiene management – so should all the resulting digestates be treated equally? All options are currently permitted by PAS110 under certain circumstances (for example, where non-ABP inputs arise from, are processed within and spread back to the same ‘holding’). Could digestates arising from Approach 1 or Approach 5 (no or partial pasteurisation) be used on holdings other than that where the non-ABP originate, so long as there is ‘line of sight’ of the material?



(original)

## Appendix 2 – FERA validation test costs

Club root (*Plasmodiophora brassicae*)

Soil bait test and TaqMan® assay - presence/absence.

| £-46.00 - 10-14 samples (each)

£55.00 - 6-9 samples (each)

£74.00 - 3-5 samples (each)

£84.00 - 2 samples (each)

£121.00 - 1 sample (each)

POA - 15 or more samples (each)

*Microdochium* sp and *Fusarium*

Bait test followed by plating out.

£191.00 - 1 sample (per test organism)

For the *Microdochium/Fusarium* testing it is difficult to cost for multiple samples without knowing how many samples are involved or how often the testing is required. There would be some economy of scale in setting up multiple samples so if you could give me an idea of how many samples would arrive at the same time for testing.