Contents

IC02: Improvement condition for enclosure of tanks storing (or treating) sewage sludge (pre-digestion)

Enclosure and suitable abatement of open pre-digestion tanks: two stage

(a) Develop and submit plan for acceptance
(b) Upon acceptance implement plan

IC03: Improvement condition for enclosure of tanks undertaking AD

As above – however if we need to use this IC the situation is dire

IC04: Improvement condition for enclosure of tanks storing (or treating) digestate

Enclosure and suitable abatement of open post-digestion tanks: two stage

(a) Develop and submit plan for acceptance
(b) Upon acceptance implement plan

IC05: Improvement condition for monitoring process parameters and digestate stability

To review evidence of a stable and effective digestion process as required by BAT 38.

Instead of moving directly to requiring sludge cake to be covered and off-gas collected and abated we are using RBP as a proxy to benchmark the industry and identify which sites produce more stable cake and those that don't. Poor performers can expect to (a) improve their digestion process or (b) abate emissions from the cake.

IC06: Improvement condition for review of effectiveness of abatement plant

Any abatement plant used to treat off-gas which is not directed to the gas system must effective treat that off gas. This IC requires permit holders to demonstrate the efficacy for that abatement plant.

IC02: Improvement condition for enclosure of tanks storing (or treating) sewage sludge (pre-digestion)

Reference	Requirement	Date	
Improvement conditions for enclosure of tanks storing (or treating) sewage sludge (pre-AD)			
ICX	**Drafting note:** Where there are open tanks pre-primary digestion BAT is to contain and abate these tanks. This IC should be included in its entirety where no enclosure or abatement has been proposed, or where the enclosure and abatement proposal is inadequate. If full enclosure and abatement proposals have been submitted and accepted but not yet implemented include only the implementation section of this IC. The operator shall submit a written 'enclosure and abatement plan' and obtain the Environment Agency's written approval to it. The plan shall contain the final designs and an implementation schedule for the installation of enclosures/covers and associated emission abatement systems in line with BAT 14 and BAT 53 for storage and treatment tanks pre-anaerobic digestion identified as [insert tank names], The plan shall include evidence that the tank enclosures/covers will be designed and installed in accordance with guidance *Biological waste treatment: appropriate measures for permitted facilities*, and provide evidence to demonstrate why the emission abatement system will be effective and meet the requirements of BAT 53. The plan shall be implemented in accordance with the Environment Agency's prior written approval. (Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values.)	DD/MM/YYYY [6 months of permit issue] or such other date as agreed in writing with the Environment Agency Implementation of all required vessel cover improvements and abatement must be completed by 31/03/2025	

IC03: Improvement condition for enclosure of tanks undertaking AD

Improvement conditions for enclosure of tanks undertaking AD			
ICX	The operator shall submit a written 'Primary anaerobic digestion vessel cover' plan and obtain the Environment Agency's written approval to it. The plan shall contain the final designs and an implementation schedule for the installation of covers for vessels undertaking anaerobic digestion in the [insert number and name of tanks]. The plan shall also contain a detailed description of the proposed gas utilisation plant, gas storage infrastructure for the biogas produced during anaerobic digestion, pressure relief valves and gas pipework. The plan shall include but not be limited to the following components: • Evidence that the vessel covers, gas utilisation plant and ancillary equipment have been designed by appropriately qualified engineers. • Evidence that the vessel covers, and gas utilisation plant will be designed and installed in accordance with guidance, *Biological waste treatment: appropriate measures for permitted facilities*. • An updated Hazard and Operability Study (HAZOP) and DSEAR risk assessment. • An assessment of gas storage capacity and gas utilisation capacity including proposals for additional gas utilisation plant. • A program of works with timescales for the commissioning of the vessel covers, gas utilisation infrastructure and ancillary equipment. The plan shall be implemented in accordance with the Environment Agency's prior written approval. (Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values.)	DD/MM/YYYY or such other date as agreed in writing with the Environment Agency Implementation of all required vessel cover improvements must be completed by 31/03/2025	

IC04: Improvement condition for enclosure of tanks storing (or treating) digestate

Improvement conditions for enclosure of tanks storing (or treating) digestate			
ICX	**Drafting note:** Where there are open tanks post primary digestion (often called post-digestion storage tanks or secondary digesters) the digestate contained in these tanks will be producing biogas and emitting to atmosphere. The digestate will also be a source of ammonia emissions. The short retention time seen at the majority of sludge AD facilities means that the digestate produced and stored in the open tanks will still be capable of producing large quantities of biogas so the assumption is gas collected from these tanks will be methane rich. The tank needs to be enclosed and connected to the gas management infrastructure, or in rare cases to a suitable abatement system which treats all potentially polluting elements of the off gas. Include this IC for any post-digestion open tanks which do not already have an acceptable enclosure plan. The operator shall submit a written 'post anaerobic digestion vessel cover' plan and obtain the Environment Agency's written approval to it. The plan shall contain the final designs and an implementation schedule for the installation of covers for vessels storing and/or treating digestate in tanks identified as [insert name of tank/vessel(s)]. The plan shall also contain a detailed description of the proposed gas utilisation/abatement plant, gas storage infrastructure for the biogas produced during anaerobic digestion, pressure relief valves and gas pipework. The plan shall include but not be limited to the following components: • Evidence that the pollutants of the waste gas (including methane) produced in tanks [insert name of tank/vessel] will be controlled and/or abated either by the proposed gas utilisation plant or proposed abatement system. • Evidence that the vessel covers, gas utilisation/ abatement plant and ancillary equipment have been designed by appropriately qualified engineers. • Evidence that the vessel covers, and gas utilisation/abatement plant will be designed and installed in accordance with guidance, *Biological waste treatment: appropriate measures for permitted facilities*.	DD/MM/YYYY [6 months of permit issue] or such other date as agreed in writing with the Environment Agency	

	• An updated Hazard and Operability Study (HAZOP) and DSEAR risk assessment. • An assessment of gas storage capacity and gas utilisation/abatement capacity including proposals for additional gas utilisation/ abatement plant. • A program of works with timescales for the commissioning of the vessel cover(s), gas utilisation/ abatement infrastructure and ancillary equipment. The plan shall be implemented in accordance with the Environment Agency's prior written approval. (Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values.)	Implementation of all required vessel cover improvements must be completed by 31/03/2025	

IC05: Improvement condition for monitoring process parameters and digestate stability

Improvement condition for monitoring process parameters and digestate stability			
ICXb	**Drafting note: this IC applies to all permits. It is designed to deliver requirements of BAT 38 relating to digester stability and to collect data on the stability of the digestate being produced. This will allow industry wide benchmarking of digestate stability and identify plants producing less stable outputs. This in turn will provide a body of evidence to determine whether sludge cake storage is likely to result in emissions in quantities sufficient to warrant abatement.** The operator shall submit a written report, with supporting evidence, on the stability of whole digestate, (i.e. prior to dewatering), stored within the [insert name of existing tank(s)] and obtain the Environment Agency's written approval to it. The report shall assess whether an effective, stable and actively managed digestion process is taking place within the anaerobic digestion tanks and whether biogas emissions from post digestion storage or treatment are likely to have been minimised. The report shall include but not be limited to: • An assessment of residual biogas potential in accordance with the OFW004-005 [N6] methodology specified by *BSI PAS 110: Producing Quality Anaerobic Digestate* or an equivalent methodology for assessing residual biogas potential of the digestate stored within the [insert name of tanks storing digestate]. • pH and alkalinity of the digester feed • digester operating temperature • hydraulic loading rate • organic loading rate • volatile fatty acids concentration • ammonia • liquid and foam levels in the digester	DD/MM/YYYY [6 months of permit issue] or such other date as agreed in writing with the Environment Agency	

IC06: Improvement condition for review of effectiveness of abatement plant

Improvement condition for review of effectiveness of abatement plant			
ICX	**Drafting note: this IC applies to all permits where abatement plant is in use and where the application does not include detailed evidence of the effectiveness of that plant.** **In the highly unlikely event that everything is connected to the gas system then this IC will not be required.** The operator shall carry out a review of the abatement plant [include names of abatement plant and emission points] on site, to determine whether the measures have been effective and adequate to prevent, or where this is not possible to minimise, emissions released to air including but not limited to odour and ammonia [include Hydrogen chloride (HCl), and TVOC if applicable]). The operator shall submit a written report to the Environment Agency following this review for assessment and approval. The report shall include but not be limited to the following aspects: • Full investigation and characterisation of the waste gas streams. • Evidence that the emission of pollutants in the waste gas stream is being prevented or where this is not possible minimised by the abatement plant. • Abatement stack monitoring results (including but not limited to odour and ammonia [include Hydrogen chloride (HCl), and TVOC if applicable]). • Abatement process monitoring results (including but not limited to odour and ammonia [include Hydrogen chloride (HCl), and TVOC if applicable]). • Details of air quality quantitative impact assessment including modelling and a proposal for site-specific "action levels" (including but not limited to odour concentration, hydrogen sulphide and ammonia) [include Hydrogen chloride (HCl), and TVOC if applicable]	DD/MM/YYYY [6 months of permit issue] or such other date as agreed in writing with the Environment Agency [for existing abatement plant] [Where abatement plant is to be installed in accordance with IC02 and/or IC04 the date will be 6 months from the installation date specified by that IC]	

	• Odour monitoring results at the site boundary. • Records of odour complaints and odour related incidents. • Recommendations for improvement including the replacement or upgrading of the abatement plant. • Timescales for implementation of improvements to the abatement plant. The operator shall implement any improvements in line with the timescales as approved by the Environment Agency. (Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values.)		